SUPPLEMENT.

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FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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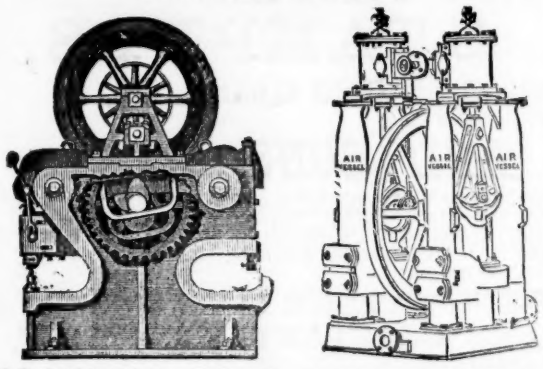

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PARIS, BRONZE MEDAL, 1867.

ORDER OF THE CROWN OF PRUSSIA.

FALMOUTH, SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the Geographical Congress, Paris, 1875—M. Favre, Contractor, having exhibited the McKean Drill alone as the MODEL BORING MACHINE for the ST. GOTHARD TUNNEL.

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At the south end of the St. Gothard Tunnel, where

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Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24·90, 27·60, 24·80, 26·10, 28·30, 27·10, 28·40, 28·70 metres. Total advance of south heading during January was **121·30 metres, or 133 yards.**

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere (7½ lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these Machines for the SEVERN TUNNEL; the LONDON AND NORTH-WESTERN RAILWAY for the FESTINIOG TUNNEL: and the BRITISH GOVERNMENT for several Public Works. A considerable number of Mining Companies are now using them. Shafts and Galleries are driven at from three to six times the speed of hand labour, according to the size and number of machines employed, and with important saving in cost. The ratio of advantage over hand labour is greatest where the rock is hardest.

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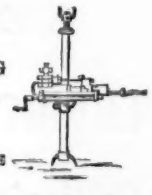

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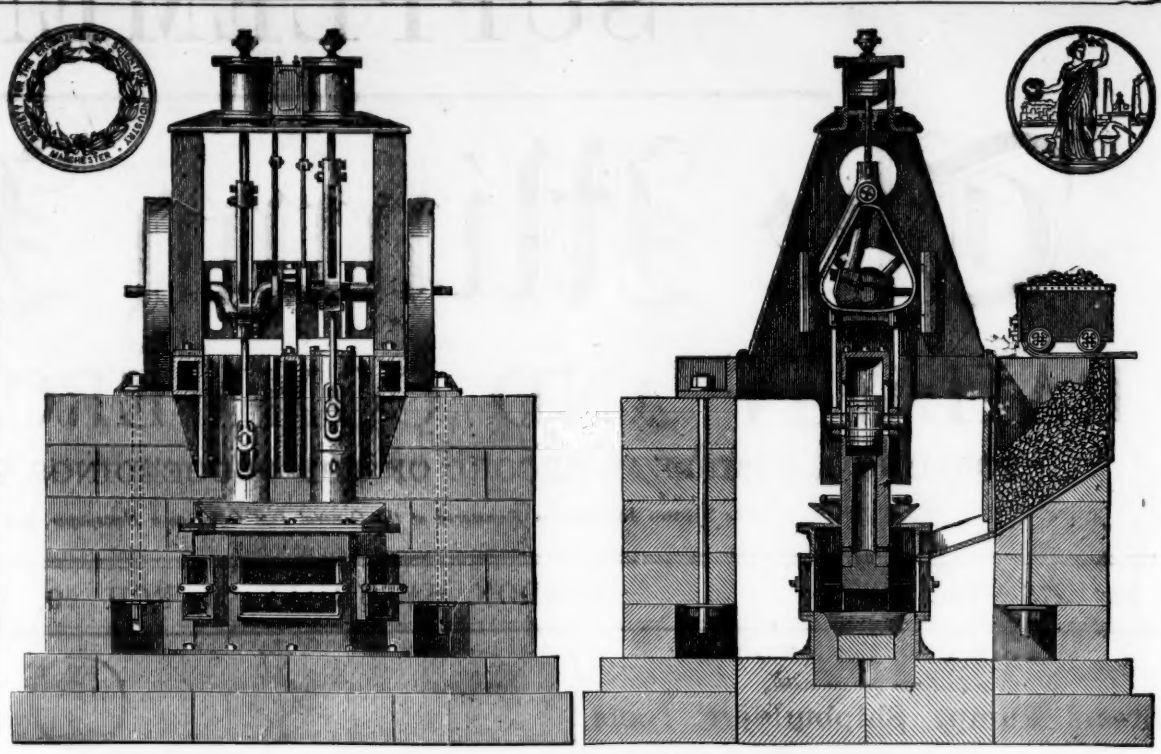

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MANCHESTER.

Original Correspondence.

IMPROVED COAL-CUTTING MACHINE.

SIR,—The question of getting coal by means of machinery has so important a bearing on the future of coal mining in this country that we think any improvement in these machines will receive the earnest consideration of all persons interested in the working of coal mines as well as the general public. To mining men anything which lessens the cost of getting coal, and at the same time furnishes a greater percentage of large coal, is sure to have their hearty approval in the present times, more particularly where the seams of coal are thin and hard, and therefore difficult to undercut at the bottom. Colliery owners in districts labouring under such disadvantages, by the aid of coal cutters, may be able to compete successfully with other mining districts where these disadvantages do not occur. In this question, in fact, is involved the very existence of many of our collieries in these times of competition for trade.

The coal-cutting machine referred to is patented by Messrs. Rigg and Meiklejon, of Dalkeith, Scotland, and has been in operation about two years at Penston Colliery, situated in the Haddington district, and belongs to Messrs. Deans and Moore. Mr. D. P. Morison, of Newcastle on-Tyne, has taken great pains to satisfy himself as to the utility of the machine, having inspected its working in the seam of coal worked at Penston Colliery in February last, and has since read a supplementary paper before the North of England Mining Institute, of which the following notes are a summary:—

Messrs. Rigg and Meiklejon's machine consists of two air cylinders resting on one end of the frame, and connecting rods to the crank shaft; on one end of this shaft the driving wheel (bevelled) is fixed; this works into bevelled gearing on the cutting wheel; the latter is held at the centre by an arm projecting into the groove in the coal. The coal is undercut by means of ten cutters attached to the rotating cutting wheel. The height of the cut does not exceed 3½ in. at the front. By means of four screws the machine may be raised or lowered at either side to suit the inclination of the seam of coal. A worm wheel fixed on the crank shaft with chain and pulleys gives a self-acting propelling motion to the machine in the process of undercutting. The advantages claimed by the patentees are:—

1.—The undercut is made close to the thill or floor of the seam.

2.—Its adaptation to thin seams of coal, the height of machine being only 16 in., and weight 15 cwts. or less.

3.—The arrangement of endless chain and pulleys for propelling the machine.

4.—The arrangement of the axle boxes and four adjusting screws is so made that the machine can be worked at any angle, irrespective of the position of the rails.

5.—The mode of holding the cutters, by which any number or shape may be used according to the nature of the coal or other mineral.

These are all points tending to make the machine a really efficient coal-cutter, which is borne out in practice in its working at Penston Colliery. The seam of coal in which the machine operates varies from 22 to 28 in. in thickness; it is worked on the longwall system, a length of 120 to 150 yards of face being usually kept.

The following is the result of the work performed by the Rigg and Meiklejon coal cutter on Mr. Morison's visit in February last. The machine was worked with 35 lbs. air pressure. The length of face prepared for the night shift is usually 130 yards, though in some cases 150 to 170 yards have been undercut in a shift of about eight hours. The work of undercutting is managed by three men and one boy. The work performed on Feb. 4 from 3·30 P.M. to 10·5 P.M. was 129½ yards undercut to a depth of 3 ft. 2 in. In this time the machine was in operation 209 minutes and standing 186 minutes, so that in the whole time of 395 minutes the average of the undercutting was at the rate of 21·3 yards per hour, and taking the time only when at work—209 minutes—the undercutting was at the rate of 37 yards per hour. It should be observed, of the standing time 30 minutes were taken up by "bait" time, and 24 minutes more stop was occasioned by the cutters not being properly tempered, making nearly an hour beyond the ordinary stoppages, such as changing rails, cutters, &c.

The cost of working the machine is estimated at per ton of coal got:—

The labour, as above	per ton	0s. 3d.
Repairing cutters, machine, oil, &c.		0 1
Filling the coal (on following day)		0 11
Interest on capital in plant		0 3½
Total per ton		1s. 6½d.

The above cost is stated by Messrs. Deans and Moore to be about one-half the cost by hand work in other parts of the mine where the coal is higher in section.

The percentage of coal of the various sizes is estimated to be as follows:—

Large coal	per cent.	60
Chews		15
Duff		25=100

By hand work not more than 45 per cent. of large coal would be obtained, that is where the seam is thicker than 28 in. In the district where the machine was in operation probably not more than 30 per cent. of large would be produced, so that by this estimate a clear gain of 30 per cent. in large, or 6 cwts. in every ton of coal produced, is to be placed to the credit of the machine work, besides the much less cost in working the coal.

Estimated cost of plant required for one of Rigg and Meiklejon's coal cutters:—

Steam boiler	£ 300
Air compressor, with steam-engine.....	520
Air receiver, or old boiler.....	30
One coal cutter with rails and sleepers	220
Air pipes and connections.....	150
Buildings	200
Incidental expenses	100
Total	£1520

With two or three machines in operation the cost of the plant would not be greatly increased, as the compresing power is sufficient for the increase.

The cost of working per annum (240 working days) is estimated as follows:—

Interest on 1520*l.* at 5 per cent.....	£ 76
Depreciation of machinery.....	76
Repairs of machinery	50
Stores, steel for cutters, &c.	50
Engine coal—540 tons at 3s.	81
Smithy coal, files, tools, &c.	9
Fireman at boiler	52
Smith, sharpening cutters, &c.	50
Wages for three men and one boy, 240 shifts at 160 yards per shift (38,400 lineal yards), at 30s. per shift	360
Total	£804

38,400 yards will produce in this seam (say) 25,600 tons, and 804*l.* ÷ 25,600 = 7½d. per ton for cutting, as above. M. E.

LONDON COAL SUPPLY.

SIR,—My silence since December last year in the Journal permeating the Midland coal fields is as little a logical sequence of the apparently tardy concentration of active co-operation on the part of the coalowners as my present resumption of this important subject can be invidiously ascribed to a "cacoethes scribendi." I perceive in a leading contemporary that the judgment of the coalowners is not to be warped by invidious powerful interest and influence, but that the adoption of my system of transit is being strenuously advocated and urged upon them. The leading railway journal this week has an article headed "Coal traffic by railway to London," in which it is stated that a saving of at least 4s. per ton can be effected *via* Boston over rail transit and attendant expenses to London, but that some coalowners cannot realise the conveyance in sacks. My exhaustive correspondence in your Journal from January to December, 1878, both inclusive, has *mirabile dictu* not called forth a single objection except on the sack question, which is so extremely simple and practical that I must restrain myself from further prolix discussion, than by stating that what is daily effected at the Great Northern and Midland metropolitan termini, and on both banks of the Thames, can be accomplished at Boston into barges for ulterior transferment into the screw colliers in constant deep water in Boston Deeps, or *cæteris paribus* at other ports.

I wish it to be generally known that Boston Deeps need by no means be to its parentage an "enfant terrible," as I am in a position to show a better result can be attained elsewhere. To dispel, then, the isolated objection which has been raised against carrying out my system in its proposed integrity, I wish it to be generally known that Yorkshire coal can be conveyed from the pit's mouth to metropolitan consumers' premises in bulk at a saving of upwards of 4s. a ton on rail transit, of course at a still greater saving if conveyed in sacks. The verification of this statement is held at the absolute disposal of the important interests at stake. Now, to conclude, the Chairman of the Great Eastern Railway Company gave evidence on March 8 last year—"The sea-borne coal prevents our coal traffic by rail," and Mr. Robert Baxter, the solicitor to said company, and Chairman of the South Yorkshire and North Derbyshire Coal Owners' Association, gave evidence on March 15 last year that "a saving of 8d. per ton in transport is quite enough to command the London market." If 8d. can command the market, what must be the effect of sixfold that saving by my system? Never has such an auspicous moment presented itself for the construction of iron steamers at a low cost.

WILLIAM JOSEPH THOMPSON.

20, *Little Tower-street, E.C., March* 25.

COLLIERY MANAGEMENT.

SIR,—It is most important that an official declaration should be obtained as to the meaning of sec. 26 of the Coal Mines Regulation Act. That section clearly states that every mine to which the Act applies shall be under the "control and daily supervision" of a certificated manager. It is, however, a commoner practice than many suppose for a mining engineer to accept the charge of two, and in some cases of three, collieries, giving personal attention to them alternately and supervising simply the reports of the deputies sent to him daily. But the Stanley explosion clearly shows what kind of result "management by deputy" is certain to result in, and it is the interest of all concerned (except, perhaps, those mining engineers who hold double positions) to put an end to it. Colliers lives would be in less danger. Owners would be freer from responsibility and pecuniary loss, and members of Colliery Companies (Limited) would probably receive dividends earlier in many cases than they are now likely to do. And, indeed, these latter persons would do well to enquire what appointments their boards are making, because as part owners they themselves are liable if they sanction any infringement of the Act.

Your article in last week's issue was most opportune, and I trust those who acted officially at the Stanley inquest will lose no time in procuring an authoritative and public declaration as to whether we are to have daily supervision of our pits, or to be satisfied with daily supervision of written reports. A COLLIERY DIRECTOR.

Liverpool, March 25.

NEW MEXICO.

THE MAXWELL LAND GRANT AND RAILWAY COMPANY TO BE DISSOLVED—OTHER IMPORTANT MATTERS.

SIR,—Not English investors alone have been victimised by American enterprise. Dutch investors have had their share in losing money on this continent. Invariably the loss has fallen on the shareholders in large enterprises managed by unscrupulous individuals, while individual enterprise as invariably has proved profitable to those who gave it their personal attention.

In 1870 the investors, in Amsterdam, the Hague, and other Dutch towns, lost $4,375,000 for bonds secured on the real estate property of the Maxwell Land Grant and Railway Company. About five years later a well-known correspondent of the Journal jointly with some high officials in the Hague obtained from some Dutch investors an amount of 3,500,000 guldens with greater facility and with less inconvenience than is probably occasioned in the appropriation of a pocket handkerchief at 9 o'clock in the morning on London Bridge. About the same time has passed since the last scheme was perfected as constituted the interval between the two; and, as there is some probability of another similar attempt being made a few months hence, it may not appear as out of order to report progress for the one of two schemes being still alive, the other having dropped out of Dutch hands entirely.

When the Maxwell Grant had been sold by the sheriff for $16,479, taxes and costs, the bondholders redeemed the property in time, and entered a suit in a Pennsylvanian court for foreclosure of mortgage by Deed of Trust.

One speculator, acquiring for a small amount some bonds, made the counter movement to enter suit in a New Mexico court for the same purpose—that of destroying his own offspring. At present the entire matter is before the Courts of Jurisdiction in New Mexico. E. Garte and Frank Springer, at Cimarron, are attorneys for the bondholders in Holland; Breeden and Waldo, at Santa Fé, for the Trustees of the Second Mortgage; Catron and Thornton, at Santa Fé, for another party. The number of lawyers engaged tells well for a long and costly lawsuit. A liquidation of costs will be facilitated by the Court deciding in next term, that a townsite may be set aside, and be sold free of indebtedness on Cimarron Creek, where the Aitchison, Topeka, and Santa Fé Railway crosses this creek. At present this railway has its terminus on the Stockton ranche, a piece of land sold by Maxwell previous to the sale to the company, but enclosed entirely by the company's land, and selected as the railroad terminus because it does not belong to the company.

It is near this new railroad terminus, called Otero, that the plumbago (black-lead) mines are situate, which produce an excellent quality of plumbago. Although to the old use of this material for pencils and crucibles a considerable addition has been made of late in various manners—its use as lining in Bessemer converters, its use as moulders' facing, and its use for lubrication of steam cylinders—the mines near Otero are not worked for lack of means with the owners to put up concentrators. The trade in plumbago is monopolised more or less on this continent by the Dixon Crucible Company, at Jersey City, New Zealand, and no mine receives their orders unless it is fairly in the market as a competitor. A private gentleman with some means, disposed to personally attend to the matter, would there find a chance for a paying business, and its largest sale would consist in lubricating plumbago, the product being of special good quality for this purpose.

Nothing as yet is known of an agreement between the bondholders of the Maxwell property and the Atchison, Topeka, Santa Fé Railroad, though some kind of agreement will become a necessity soon, unless by the sale of bonds the control passes into the hands of this very railway company.

The railway construction over the Maxwell land is, nevertheless, continued, and will soon pass its southern boundary. The inhabitants of the Territory of New Mexico are at present much agitated by the question where the railroad will reach the valley of the Rio Grande—this traditionally little paradise. Whatever will be the selected point the line will pass but a short distance from the large copper mines on the Tuerto Mountain, in which your correspondent is interested, and as the inhabitants of Bernalillo, not only the richest but decidedly the nicest town in the territory, are moving energetically to have their town selected as the joining point there is some good hope to see the railway pass one half-mile below the mines, there being a convenient and easy pass on this line. As the question of coal was so far against this line your correspondent explored it lately for the purpose of finding coal near it, and succeeded in finding the outcrop of three veins within a distance of less than 20 fathoms, of which two vertical have a good roof and such thickness as to ensure profitable working. Also, there is an opportunity for an individual and promising enterprise; and as the land may be bought for from $15 to $20 per acre on long terms, and as the veins are cropping out and being on a convenient incline, the investment required is but small.

Any private information on this and other matters parties may desire I shall give with pleasure, and without any charge therefor. By all appearance the approach of the railroad will result in an excitement and rush to the Sandia Mountains, the pioneer prospectors crowding in already at present. So far discoveries of large veins in the limestone overlying the granite have been made, showing gossan, galena, traces of silver minerals, and baryta; but as yet not sufficient work has been done on them to properly judge of their value. If precedents do not deceive they will turn out to be good ore deposits, though at present a few hundred dollars would bring them out of the hands of discoverers. One of the American merchants longest established in the territory, N. Bibo, at Bernalillo, a German by birth, acts as real estate agent, and I consider him a trustworthy party to address to, personally or by letter, in any case where advise be desired in business matters.

A very favourable circumstance to the development of the resources of the territory consists in the fact that by the energetic action of Carl Schurz, the Secretary of the Interior at Washington, the corrupt ring controlling the courts and revenues of the territory has lost its cohesiveness, and is reduced to the defensive against indictment by the grand juries of the country. Life and property thereby have become more secure. The new Governor-General, Lew Wallace, means well, and, unless caught in the meshes of the ring by intrigues, will do well for the territory. F. M. F. CAZIN,

Copperfield, New Mexico, March 3. Mining and Civil Engineer.

ORE CONCENTRATION.

SIR,—The quantity of gold lost in California mines may safely be stated as one-third of the amount produced. The means devised thus far to prevent this loss have been numerous, but very few of them have proved to be of any practical value. It appears that, in the construction of most contrivances for the saving of sulphurets, as well as for free gold, the laws of specific gravity, or the crystalline structure of the atoms composing the ores, and the physical character of the same, have been ignored by the inventors.

The object aimed at in concentration is simply to separate the heavier particles of the pulverised ore from the lighter ones—or, in other words, the metallic portion from the gangue matter. After having ascertained the composition of the ore, a careful study of how each of the minute particles will move under a column of water, how they will conduct themselves on plain surfaces when mixed with water, &c., must govern the engineer in the construction of concentrating machinery.

Having recently examined the mines of a company which claims a perfect concentration the following data may be of interest in regard to mixed ores:—

About two-thirds of the ore is white quartz, and the rest a mixture of galena, zinc-blende, and iron pyrites, each of which is of different crystallic form and specific gravity. After separating the different minerals to themselves, the value of each was ascertained to be as follows:—

Iron pyrites .....contained per ton	$ 240 gold.
Zinc blende	450 gold.
Galena.....	1250 gold.
Quartz.....	None.

By pulverising ore of this composition we find that galena, being the softest, will be crushed finer than zinc blende, and the latter finer than iron pyrites, while the quartz will be the coarsest. It will, therefore, be easily understood that most of the precious metals would be lost if they were not separated according to their size, and each grade treated by itself, and by a separate machine. This is admitted to be the only way in which the largest portion of the gold can be saved, and all attempts which have been made to accomplish the same result by a single operation or machine, either by a wet or dry process, have proved to be unsuccessful.

I have lately constructed concentrating works for several mines upon the principle described above. They are intended for mixed ores which cannot be worked by the ordinary process of stamps and blankets.

In conclusion, it may be stated that if it is claimed for any machine that it will concentrate any kind of ore, and as it comes from the mill, and by a single operation, it must be considered as a presumption on the part of the inventor, in which assertion those of our mine owners will concur who have lost their money by experiments of this kind. J. MOSHEIMER,

Civil and Mining Engineer, Practical Chemist, and Metallurgist.

San Francisco, California, Feb. 28.

NOUVEAU MONDE GOLD MINING COMPANY.

SIR,—In 1854 I was induced to buy some shares in the Nouveau Monde Company, and for a quarter of a century I have never seen a report or statement of accounts, and now I hear the shares are in demand at 12s. to 15s. per share. Can you inform me the cause of the sudden demand, and if the company has declared any dividends during the interval? Also, if there is any liability attached to companies formed on the "en commandite" principle?

A SHAREHOLDER.

[Although we never interfere in sharedealing matters, we may probably assume that the demand has arisen in consequence of the recent gold discoveries on property belonging to the company in Venezuela—which discoveries have been fully noticed in the *Mining Journal* during the past few weeks—and most recently in the letter of Mr. F. Paganelli, published last Saturday. As that gentleman signs "managing director," he is probably the "gérant" of the company, and will no doubt give all particulars. If "Shareholder" will refer to the *Mining Journal* of Nov. 8, 1851 (vol. 21, p. 546), he will find his exact position stated. It is there explained the company is established in France with a capital of 5,000,000 fr. (200,000*l.*), in shares of 25 fr. (1*l.*) each to bearer, with no further liability. In accordance with the French law of "commandite" the affairs are conducted by the Gerant and Council of Supervision in Paris; "but powers have been obtained by which the entire control of the company's affairs in England and California is under the superintendence of a council of seven gentlemen in London." Messrs. John Taylor and Sons were the engineers. It was further stated that "by the operation of this law of commandite the liability of each shareholder is limited to the amount of his share, and the shares being to bearer *(au porteur)* are transferable, like a bank-note, and are not subject to registration or calls, and no deed has to be signed." We have not heard of any dividends having been paid.]

CONSOLIDATED HERCULES AND ROE SILVER MINING COMPANY.

SIR,—The above company own and work the Hercules lode, 3000 ft.; West Hercules lode, 3000 ft.; Seven-thirty lode, 3000 ft.; East Roe lode, 1500 ft.; John E. McClurg lode, 3000 ft.; John M. Wilson lode, 3000 ft.=16,500 ft. Patents from the United States Government give this company over one mile in continuous length along the great ore vein known by the names of the above locations, and situate in Clear Creek County, Colorado, U.S.A. The Hercules tunnel, 160 ft. in length, cuts the Roe at 125 ft., and the Hercules 12 ft. further. This tunnel is laid with a tramway, which is continued along the drift on the Roe vein 40 ft. to the main shaft, and on the Hercules vein 640 ft., and on the Seven-thirty vein 160 ft. The ground between this main level and the level above is being worked, and produces mineral varying from 100 to 500 ozs. silver per ton. The Seven-thirty level is being worked, and produces from 200 to 500 ozs. silver per ton. On the Hercules, and its continuation the West Hercules, lessees are stoping and cross-cutting to the south wall of the vein 550 ft. west of tunnel. This cross-cut has been run 25 ft. through porphyry dike, and has just cut quartz. It is expected that there is a body of mineral on the south wall.

Three shafts have been sunk from Tunnel level, each disclosing rich mineral; that from the West Hercules shaft assaying 900 ozs. silver per ton; this shaft is 80 ft. deep. The Roe shaft is 90 ft. deep, with several drifts disclosing high grade mineral. It is intended to place an engine and hoisting machinery over this shaft, and continue sinking and running the drifts east and west.

The Seven-thirty shaft is the only one at present worked, and is

45 ft. deep. Drifting east from this shaft a fine body of ore has been struck, 6 to 8 in. wide, the first lot of 2¼ tons averaging $84 per ton. The ore now being taken out promises to run from $300 to $500 per ton. The ore seams in these veins appear to unite as depth is gained, forming larger and richer bodies, which, with proper hoisting machinery, can be worked to great profit.

Above the Tunnel level three adits have been run on the outcrop of the vein west of Brown Gulch, leaving 60 ft. of stope between each; the two lower of these are now 400 ft. long, and are laid with iron rails; both are producing galena, mixed with grey copper, running from 500 to 1000 ozs. per ton silver. The third or uppermost level is 180 ft. above Tunnel level; it is 30 ft. long, and is being driven from 1 to 2 ft. per day. It shows a fine seam of quartz, with mineral running from 100 to 200 ozs. silver. On the east side of the gulch, seven levels have been run in on the outcrop of the vein, varying in length from 30 to 200 ft., bearing more or less mineral, which runs from 100 to 400 ozs.

Some 3000 ft. of drifts have been run, and 600 ft. of shafts sunk, showing mineral in every part of the vein opened. The out-turn is estimated at $250,000, or 50,000*l.* sterling. Since the advent of the present management towards the end of last March the profits have been devoted to developing and improving the property, preparatory to more extensive operations in the Spring.

Denver, Colorado, March 2. —— GLYN W. E. GRIFFITH.

CANADIAN MINING NOTES—No. II.

SIR,—The Province of Ontario was formerly the Province of Upper Canada, and before that part of Canada itself. This country has passed through several phases of existence. At the first settlement of the country, when Jacques Cartier came up the St. Lawrence, it commenced its existence, so far as the inhabitants of Europe were concerned. Under the French rule it was the Province of Canada, with Quebec as a capital. In 1792 this province was divided into Upper Canada and Lower Canada, the line of division commencing on the northern side of the St. Lawrence, not far from Cateau du Lac, and running north to the Ottawa river, Lower Canada took all north of the Ottawa river, all east of this line, and all south of the St Lawrence. The western boundary of Upper Canada was not defined, as it ran into the wilderness. In 1840, after the rebellion of 1836 37, there was a union of the provinces, and both Upper and Lower Canada became Consolidated Canada. But this union was like many matrimonial unions—it was like putting oil and water together. It was based on an equal number of representatives, and Upper Canada became more populous than Lower Canada George Brown and the Globe newspaper got up the agitation of representation by population. Upper Canada was said to be the milch cow, and Lower Canada to take all the milk. This agitation continued, and, in 1862, when John A. M'Donald fell, on the Militia Bill, the representatives of the people were pretty well divided. From 1862 to 1865 there was no majority in the House which could be called a real working majority, and there had been at least two Governments, with many changes. The American war had broken out, and was raging, and the provinces, partly by outside pressure, partly on account of internal struggles and the difficulties of Government, were drawn into confederation—one of the best schemes yet adopted by the Anglo-Saxon race. For the last ten years it has worked well. The first five was the most difficult, but there was a well-tried and able leader at the head of the Government, and a Government of known ability. All the different systems of postal arrangement, of revenue, and of laws had to be settled, and they were settled with marked success.

During the time the M'Kenzie Government was in power not much was done for the development of the country, although a great deal was done for the benefit of the Grit party. Still they could not neglect everything, and work was continued on the public works of Canada, the canals, and the railways. A Bill was introduced for the better transfer of land in the north-west, founded on the Australian system, and an arbitration was instituted for determining the boundaries of the Province of Ontario. Now, Ontario is bounded as follows—taking the old limits of Upper Canada, north to the head waters of the Ottawa, thence north of Hudson's Bay, thence west along the margin of Hudson's Bay to a point, thence south through Kewatin or Rat Portage to the boundary line between the United States and Canada.

By this arbitration we have obtained for Ontario a much larger section of country than any person in Ontario expected. The extent of the province west of Georgian Bay now is nearly as large again as the old settled parts of the province. It is a great heritage, and requires a good strong government to develope it. As long as we have the Mowat Government in power we need not expect to obtain any statesmanship. Mr. Mowat calls himself a Liberal and Reformer, yet as a public man he has shown himself to have little ideas of either progress, reform, or economy. However, he is to be credited with the results of this arbitration, and the able manner in which the case was placed before the arbitrators. Why he did not bring in some Act this year to develope the new territory is more than can be answered. It is a splendid mining country, and the map which I enclose of a portion of it west of Thunder Bay will give your readers some idea of the country itself. Other countries, such as Germany and Sweden, have had sense enough to use the money of the Government to develope the mines of the country; but in Ontario, with millions of undeveloped wealth, the Government do nothing, and the people are not rich enough to sink money in prospecting. However, it is generally supposed that this will be the last time these Ministers will have any power, as the election takes place before the next session. So we may hope with a new Cabinet the people will obtain something in way of progress

So far for the new acquisition to Ontario. Whether it will be governed any better than in the hands of the Dominion Government remains to be seen. More than probable in a few years a new province will be formed between Ontario and Manitoba, and the section from Thunder Bay to Manitoba be taken in. Still it is difficult to say whether Manitoba will not take in the eastern portion of the territory, and thus absorb between them the whole of the district of Kewatin.

The accompanying map will give some idea of the localities. The Pacific Railway is graded to English river about twice as far from Thunder Bay to Nordland. In the township of Moss, called after the Chief Justice of the Court of Appeals of Ontario, a rich gold and silver mine has been opened. It is called the Jack Fish Lake Mine, and is situated on the high lands near Lake Shebandowan, about 80 miles from Prince Arthur's Landing. It was discovered by some Indians; they sold it to some residents of Prince Arthur's Landing. These residents, when the Silver Islet Company were commencing operation, sold part interests to Captain Frue, and he, together with others in Toronto, formed the Jack Fish Lake Mining Company. It is said that he paid $25,000 for his interest even at that time, when it had not been opened, and had not been tested at all. Work was put on and developed; but the crisis of 1873 came on in the States, and the people of New York could find no money for new enterprises. However, the mine was tested, and here is a copy of the result from one of the principal smelters in the United States, and the most reliable:—

Newark, New Jersey, Nov. 10, 1874.

SIR,—We have referred to our books, and found we received a keg of ore from you July, 1871, weighing 124 lbs., and which assayed $396 80 in gold, and $121·18 in silver per ton: total $517·98 per ton of 2000 lbs. H. BALBACH AND SON.

Mr. C. A. Trowbridge, Detroit.

This vein is about 4 ft. wide, and good paying rock has been found, as the reader will perceive from the assay. This is likely to turn out a very rich paying mine—so much gold and silver—and it is only the beginning of what Nature seems to have laid up in this portion of Canada. Mr. Peter M'Kilear, one probably the best acquainted with this portion of this locality, seems to think it one of the best. I wonder why the people of England wander off to out-of-the-way places in the States for the purpose of putting their money into mines. There is no country that has really such splendid mines as Canada, if they were only developed. Yet they are not to blame so much when the Government seem so lethargic in opening up the mineral wealth of the country.

The Jack Fish Lake Mining Company has a capital of $600,000, in 60,000 shares of $10 each. About $300,000 has been taken up, and the company proposes, I believe, to commence operations in the spring.—*Toronto, March* 7. BOURNONITE.

IS IT RIGHT TO PAY ANY PURCHASE MONEY FOR MINES?

SIR,—The answer to this question by a prudent business man would, I think, be almost invariably in the negative; and when we consider the manner in which the investing public have been swindled by the owners of foreign mines aided by English and Scotch merchants, bankers, and promoters, their opinion would be still more confirmed in the wisdom of allowing the proprietors of valuable mines to retain their interest in properties they know so well how to praise. But admitting this, does it follow that Englishmen who have had such a sad experience of allowing others to pocket their money for so-styled valuable mines by a process that, to an ordinary business man, seems to display, as regards the dupes, little else than childish simplicity—that Englishmen are to button up their pockets and sulk to such an extent that they should entirely cease from investing their money in genuine mining ventures abroad, not even in their own colonies, and confine themselves entirely to the working of the minerals of Great Britain, which cannot pretend to compete in profitableness with many virgin deposits elsewhere? It would seem that such is the present mood of the British capitalist, and in confirmation of this statement I can instance the case of the company I represent, who are the proprietors "in fee simple" under the British Crown of over 40 square miles of the most valuable mining lands on the north shore of Lake Superior—a district whose mineral wealth is now being so prominently displayed by the wonderful results of mining at Silver Islet, where over 160,000*l.* sterling worth of silver has been produced since August last. These lands were selected after the most searching exploration, and over 60,000*l.* has been expended upon them, and have been in possession of our company for over 30 years, yet we have made unavailing efforts these two years past to obtain the necessary capital from our own countrymen to develope this property, notwithstanding that *no purchase money* is required, the money of the proposed investors going entirely to the development of the property. And notwithstanding being furnished with the highest practical and scientific opinion in America as to the probable profitable results of the working of the deposits which, even at the present price of metals, would yield a profit of 50 to 100 per cent. per annum, yet, after weeks of tentative efforts, I receive to-day the following report from the solicitors who have it in hand: "The continued depression in the City, and the fear that we had not reached the lowest state, made it difficult to get anyone to listen to any new project." And this has been the tale for three years past!

Now, when we learn from the Chicago Correspondent of the Times of to-day that the 5 per cent. loan of $3,000,000 for the Province of Quebec was taken up at par at New York in a very short time, while money is loaning at 1½ to 2 per cent., and when we know that it is utterly impossible to induce British capitalists to put their money into foreign or colonial mines under any conditions, one is constrained to believe that they have either lost their courage or abdicated their position of being the sagacious and enterprising adventurers they have hitherto been, and concede the palm for these qualities to our enterprising Cousins over the water. At least, this is the view I am forced to take while returning to Canada with my finger in my mouth, and with the disagreeable prospect of having to seek of our aforesaid Cousins the aid we cannot procure here.

Tavistock Hotel, March 27. W. W. STUART,
President Quebec and Lake Superior Mining Association.

THARSIS COPPER AND SULPHUR COMPANY.

SIR,—I read with much surprise the statement with regard to the litigation that has been going on, and so far as I can see is likely to go on, with regard to the property of this company, and I should like to enquire through the Journal whether the shareholders have been from time to time informed that this litigation was going on against them, and whether the Chairman has had the authority of a regularly convened meeting to neglect to put in an appearance in the French courts. As the French proceedings appear to have been altogether ignored on behalf of the company would it not be well for a definite statement to be published by the executive, stating exactly the nature of the title to the mines held by the company? Have all the transfers been regularly and properly made by Messrs. Gosse and Haselden or their representatives to V. Mercier and Co., and by V. Mercier and Co. to the Tharsis Company; and have these several sales and transfers been duly registered in the Spanish courts in such a manner as to be recognised by Spanish law?

These questions are momentous. If the Tharsis Company are the only proprietors recognised by the Spanish law the official announcement of that fact would be a great relief to shareholders, and would prevent the decline in the value of shares, which is otherwise inevitable. This statement would have to be accompanied by evidence that the purchase-money has really been paid by the company to the persons legally entitled to sell, as without that there would be every prospect of litigation; and, with litigation and ruinously low price of produce combined, the position of the shareholders would indeed be deplorable.—*Stirling, March* 25. SHAREHOLDER.

THE RIO TINTO COMPANY—THE HUELVA DISTRICT.

BRITISH TRADE WITH SPAIN.

SIR,—Under the above heading "A Rio Tinto Shareholder" has called attention in the Journal of March 8 to the importance of utilising the vast quantities of sulphur which are at present wasted in the Huelva district to the great detriment of the surrounding country. I am glad to see that in addition to the Hollway process which he names, and which is now attracting such general attention, another discovery is mentioned in your Journal, which also promises a practical and economical solution of this important question. I refer to that made by Mr. Doetsch, who, as a director of the Rio Tinto Company, will no doubt be willing to let the company have the benefit of his invention on reasonable terms. I have neither sufficient information nor scientific knowledge to enable me to offer an opinion as to the relative merits of the two processes, but no one who holds any interest in the company can fail to see the importance of the question at issue, and as it is hardly to be expected that the officials can be altogether unprejudiced judges of the advantages of an invention of one of their own directors, I think the interests of the shareholders would be best consulted if a careful investigation of the two processes were made by some well-known and independent scientific gentleman, who should be instructed to report thereon. These referees might be selected by the board from lists submitted to them by the respective patentees—say, two from each list—and in the event of the referees not agreeing in their report, and being equally divided, they should be empowered to appoint an umpire, whose decision should be final. The patentees would thus have an opportunity of submitting their inventions to the consideration of impartial judges, and the shareholders would have a greater assurance that they were securing the more advantageous system.

If this plan were adopted at once the report of the referees would be submitted to the annual meeting of the shareholders in May next, so that the necessary steps might be taken without delay in this most important matter.

London, March 25. ANOTHER RIO TINTO SHAREHOLDER.

DISCOVERY OF LEAD ORE IN THE NORTH OF ENGLAND.

SIR,—I have heard so much lately about the rich discovery of lead ore at the Green Hurth Mine that I made up my mind to go and see for myself, and when I got there I confess I was surprised to see such a splendid deposit of lead ore. And after due consideration I have no hesitation in stating that it is the largest and richest deposit of lead ore ever met with in the North of England. Hudgill Burn Mine, in Alston Moor, was considered a rich mine about 50 years ago, but it would bear no comparison with Green Hurth at the present time. Lunehead Mine was, I consider, the richest lead mine ever opened out in the North of England, and particularly for silver, but even this mine was not to be compared to the rich discovery just made at Green Hurth. The W. B. Lead Mines and the London Lead Company's mines are extensively worked, but they are generally considered poor, and raise a large quantity of ore only by the great extent of their operations, and are not at present paying cost; but the Green Hurth Mine will not only produce a large quantity of ore but at a very little cost, and will not only employ a large number of hands but will pay very handsome dividends to the shareholders, who are highly deserving for their enterprise and perseverance. JACOB FOREST

Darlington, March 26. —— (an old lead miner).

HOLLWAY'S PROCESS FOR TREATING METALLIC SULPHIDES.

SIR,—The remarkable correspondence addressed by "Miner" to your Journal upon Mr. Hollway's process for treating metallic sulphides, though it is not unprecedented in the experience of inventors, seems to be scarcely warranted by the circumstances with which it deals so harshly. If the gentleman who wrote it has private interests which clash with the new sources of industry which Mr. Hollway proposes to open up, one can understand him taking up the line of adverse criticism which he has adopted; but we cannot understand how an unprejudiced person of scientific attainments and philosophic foresight can so openly and unhesitatingly condemn the process upon grounds unproven, and reasons possibly fallacious. "Miner's" knowledge of the facts of chemistry, superior to ours, will render him conscious that the theory of the process is based upon strictly scientific data, a part of which Mr. Hollway's energetic researches have placed on record, while his perception of the difference between the experiment and the manufacturing operation, so remarkably acute in this instance, should surely prevent his criticising it in the unkindly spirit he has thought proper to evince. His argument is as follows:—"In your 12 months work you have developed a novel theory for a new and important metallurgic operation, supporting it with a series of experiments, which, however, do not show economic results; and, therefore," says he—please mark the inference—"you cannot produce economic results. Your experiments have cost let us say 1000*l.* or 2000*l.*; the regulus you have made is worth probably about 5*l.* 4s. 2d.; and, therefore, your products will not pay for cost of manufacture."

"Miner" is, on the other hand, doing Mr. Hollway a great service if he can reasonably convince him that his process cannot possibly yield economic advantages over the present methods now in use. If, therefore, his own researches on this subject can show this in figures, we beg him to put them before Mr. Hollway and his friends, and spare them all further thought upon such an unprofitable matter; but if he cannot do this he reduces his remarks to mere anonymous opinions, possibly tinged by prejudice, not much heeded by those thoughtful and competent scientific men who are willing to judge for themselves in this matter. "Miner" has, it seems to us, entirely shut his eyes to the enlightened and intelligent way in which Mr. Hollway seeks to obtain his results, not by seeking to misrepresent facts or screening from public attention adverse data and criticism. He little sees the great plan the many interests the inventor would create, not wholly without some recompense, let us hope, for the trouble and expense it has involved. The vast scale of the operations necessary to secure the greatest economy has, we should think, necessarily precluded a private and non-technical individual from carrying on a great manufacturing industry, in order to test this process as it undoubtedly deserves to be tested. Apart from this, the short time which has elapsed since Mr. Hollway's first experiment has been well occupied in developing the process, and obtaining the important results laid before the Society of Arts on Feb. 12.

—— AMICUS INVENTORIS.

ANOTHER STRIKE AT DEVON GREAT CONSOLS.

SIR,—After four previous reductions of wages at these mines during the past couple of years the men were called upon to make another drop of 10 per cent., besides giving an extra day's work to their generous employers every two months for nothing. This, it is said, reduces their wages to 12s. 6d. per week. How much further are the men of Devon Great Consols to be driven towards actual starvation?—*London, March* 27. ENQUIRER.

MINING IN THE FLINTSHIRE DISTRICT.

SIR,—There is an old saying, that "where the treasure is there will the heart be also." Acting partly upon the above statement, and partly to obtain the benefits of relaxation and freedom from business anxieties and fresh air in a mountainous district, I have lately had a 10 days' ramble in the lead mining district of Flintshire and Denbighshire, I combined a little business with pleasure, making my journeys and excursions sometimes on foot, sometimes by rail, and once or twice by trap conveyance. Besides my own private observations, I have mixed much with captains and privates connected both with limited companies and private concerns. I have seen the eyes of interested parties sparkle again with the thought of the probable return of prosperity to the staple industries of this portion of the North Wales district. I have seen the products of a lead mine whose value in September last was 20,000*l.*, increased in March so that its shares were now selling at the rate of 40,000*l.* I have heard on first-class authority that another mine with a very small outlay comparatively, will increase its productive power ten times. It has been in interesting company where I have heard discussed the geological formation and bearing measures of the whole of the Flintshire and Denbighshire district from Talargoch to Minera. To sit in such a company and listen carefully to the remarks of scientific and practical, and unscientific but practical minds, is a treat well worth going a considerable distance to enjoy. Where you can have the stratification of such an extensive district painted to you in word description of an easily understandable character is well worth making a sacrifice to obtain such knowledge as will enable the searcher for information to come to such conclusions and judgment as that he may be likely to be correct in his decisions, and enabled to invest any money he may have to spare in undertakings to pay at least a reasonable percentage on his investments. Of the mines in active operation and productive, the Great Holway, St. Patrick, North Hendre, Prince Patrick, Victor, Pant-y-Mwyn, Gorsedd, Rhyd Alyn, Lead Era, and Bodidris seem to be the most in favour.

The immediate neighbourhood of the old Westminster Mining Company, near Llanarmon, has been under exploration for some time in anticipation of the coming bright prospects in the lead market for the last 12 months. It is currently reported that a company in this district with good prospects is in course of formation with a very large capital, I think a million of money. Another property immediately adjoining the last named is being worked by private enterprise with very extensive proved main lodes, and literally full of cross joints or feeders. I am informed on really first-class mining and engineering authority that this last named property, now known by the prettily euphonious name of the Lady Ann Lead Mines is one of the best properties in the whole of the Flintshire district, and with a comparatively small outlay will be likely to prove a sound and good investment. It is known to be clear of water at 100 yards deep. There are several excellent shafts already sunk, and I believe the present owners have men sinking a shaft on the back of the Westminster vein, which runs directly out of the Lady Ann sett into the Westminster Mining Company's property, from which I heard the statement made that a certain gentleman in the neighbourhood could prove that a million of money had been paid in profits to its shareholders. I have it on good authority that it is intended to form the Lady Ann Mine into a limited company, with that practical, experienced, and intelligent mining and civil engineer as captain, William Francis, of Northop. It is an advantage to this property that there is no dead rent, and the royalties are the easiest in the whole district. Water for washing purposes is easily obtainable without any extra cost. A noticeable feature in the reviving spirit of lead mining is that Captain Absalom Francis, of Wrexham, under a London direction, is opening up the extensive Gwernymyndd Lead Mines, and is preparing some powerful and effective machinery to put this valuable property into

a paying condition. For the sake of the proprietors, for the sake of the neighbourhood and those engaged, I trust the efforts of all combined will be successful. I hope to be in the Flintshire district again shortly, when, if I have time, I will follow up my previous observations and report the result to you. ENQUIREE.

Lancashire, March 25.

NORTH WALES SLATE TRADE.

SIR,—If your correspondent, "C. E.," will look again at my letter in the Journal of March 15 he will see that I said a further reduction of 15 per cent. might well be made in the "slate-makers' wages," and this would enable the quarry-owners to further reduce their price-lists by another 15 per cent., making 30 per cent. in all; of course, in the term "slate makers" I include all the labour employed at the quarries. The quarries with which your correspondent is acquainted must be placed at a great disadvantage if, as he says, royalty, carriage, rates, and taxes make up 50 per cent. of the cost of production. I have now before me the accounts of a quarry in which the year's sales of slates are 13,000*l.*, the cost of production, exclusive of royalty, carriage, rates and taxes, &c., being over 10,000*l.* I contend, therefore, that there is still ample room for a further reduction in wages, and, indeed, this is absolutely necessary if American competition in this trade is to be stopped. X.

March 26.

WELSH GRANITE QUARRIES.

SIR,—The letter of "Would-be Investor of £4000," in last week's Journal, displays such an utter want of knowledge of this subject as to render it quite unnecessary for me to say more than that I am now fully satisfied with the views I first entertained of him as a specimen of a 3 per cent. investor. I am also quite convinced it would be a very venturesome act on his part if he, upon his own experience of business pursuits, attempted to improve his 3 per cents. My friends and myself, however, are content with our chance of realising somewhat more than 3 if not 50 per cent. interest upon our outlay in the investor's iron-bound coast, and shall continue to invest in the very important and, I venture to hope, highly remunerative branch of British industry—the Granite Sett Quarries along the shores of the famous Carnarvon Bay. EDMUND SPARGO.

Bangor, March 27.

PENSTRUTHAL MINING COMPANY.

SIR,—From communications to the Journal concerning this mine I am beginning to apprehend that the present workers will not realise the wealth which I believe lies underneath their present works. It is to be regretted that their financial position has obliged them to pledge their stock on a bill of sale to raise funds—the last resort of a poor man in difficulties, and indicative of an early "selling out." The sett is one of the best in the large district in which it is situate, and contains all the essential elements of success:—1, the number of the lodes is large, and very slightly operated on; 2, the position is good, having Wheal Buller at the north-west, the old Penstruthal part of the sett at the south, Tresavean Mine near, and numerous rich mines in all directions—or that were so at least; 3, geologically the mine is happily situated. The Tresavean great cross-course intersects the sett, and there is the junction of granite and clay-slate in it also. To make the mine pay depth must be attained. In my opinion it is useless to keep playing at shallow levels. The neighbouring mines did no good at very shallow levels, except the last Wheal Buller. I am sorry that the parties who have been keeping the engine at work have not the means or the spirit to work effectually; for it is better to stop at once than go on in their present fashion. No good can come of it. R. S.

Truro, March 26.

GWENNAP—BELL VEAN MINE.

SIR,—It has been a source of pleasure to read the letters which have from time to time appeared in your valuable Journal in reference to the above promising young mine. Being in the Redruth district one day last week I took a stroll to the above mine, and came away with a strong conviction that this is one of the most promising concerns in the county of Cornwall, and if carried out in a proper manner I am certain that it will prove another Gwennap prize. I am informed the lode which has been lately intersected is richer than was at first anticipated. I saw some splendid rocks of tin which were broken out of the lode while I was on the mine. It was really magnificent stuff.

I think "Cornubia" struck the right nail on the head in congratulating Mr. Parkyn. That gentleman has always held a very high opinion of the property, and I am very pleased to see that his predictions have proved true. I am assured that Mr. Parkyn is a thorough practical miner, especially in the tin-dressing department. Let us hope to see some of his "Save-all Dressing-floors" erected at this mine. In conclusion, I wish Mr. Parkyn and his fellow-adventurers every success, which I think cannot fail. NONCON.

SOUTH CAMBRIAN MINING COMPANY.

SIR,—Seeing in last week's Journal a most unjustifiable attack made on this mine by an anonymous writer signing himself "G. J.," I consider it my duty, as the agent of the mine, to send a few lines so as to remove any false impression that such mischievous and untruthful statements might possibly engender in the minds of those holding an interest in the property. My report will be found in the columns of this week's Journal, by which it will be found that we are opening out a very rich course of blende, and which is continually increasing in productiveness as depth is being attained. which our adit level in driving eastward for the next 100 fms. will continue to do, and will then have gained a back of about 70 fms. The lode on an average, so far as we have seen it, is 20 ft. wide, and can be stoped away for 30*s.* per cubic fathom, our present forebreast yielding 3 tons of rich blende per fathom for the width carried in driving (5 ft.); and the adit level, for 600 fms. in length, will pass through ground on the course of the lode, which will leave a back of 60 fms. on an average. The truth of the above statements may be verified at any time by anyone holding an interest in the concern, and I shall be happy and proud to show them over the mine, in order to satisfy them that the false insinuations made by "G. J." have not been made against the mine, but in order to do a personal injury to myself in particular, and also to others connected with the property. I shall not again, under any circumstances, reply to this scribbler, but shall content myself with the motto of the Gwir yn erbyn y byd, or *Anglice*, "Truth against the world."

Cwm Darren, Goginan, March 26. ANDREW WILLIAMS.

OLD HERODSFOOT MINE.

SIR,—I noticed the remarks of Mr. William Derry, in last week's Journal, respecting the above, and in reply let me ask if it be not true that in consequence of the pipe or shoot of ore having dipped south between two cross-courses in the present Herodsfoot Mine that that was not the cause of the abandonment of North Herodsfoot? Under these circumstances can it, therefore, be possible to find dupes to become shareholders to put their money into an exhausted lead property. Then, again, he speaks of another grant being added to it north for more than 200 fathoms. What good can this do them if there is no ore in the ground, as I would have my readers to understand it does not follow that because the lode passes through the grant there will be found ore in workable quantities, as vast unproductive tracts on the course of the most productive lodes ever discovered has proved this over and over again in all mining countries throughout the world.

When men take it upon themselves to deal with the merits or demerits of mineral properties they should first be thorough practical authorities, and of undoubted honesty. I rather think that I have from time been misguided by this coach-building expert in becoming a shareholder in several tin mining companies on Goss Moor, near Roche, and although tin ore was worth at that time nearly 100*l.* per ton tens of thousands of pounds were spent, and all lost, with little or no returns. Let, then, the public be aware when they read your valuable Journal that the advice of some of your correspondents is unworthy of their attention and does an incalculable amount of injury to sound and legitimate mining enterprise. PETER GOIFFON.

MINES AND MINING IN CARDIGANSHIRE.

SIR,—As a subscriber I have read the letters written by your correspondent, "G. J.," on the Mines and Mining in Cardiganshire, and as he seems to take credit to himself in the matter perhaps it would not be asking too much of him to give the public, through the medium of your valuable Journal, a little of the benefit of his practical experience, since he undoubtedly would not write so much without having some definite object in view. I find he intimates that he has upwards of 5000*l.* invested in the county, and has not disposed of a portion of his interest, and has, moreover, reason to believe with a better price for lead he will have no cause to regret the investment; but he points out that "one does not expect every egg to hold a chicken."

What I simply ask your correspondent for is to let the poor deluded public know the eggs he has got, and then they will be enabled to form their own conclusions as to the chickens they may expect to get. In passing through the list of the mines he has already given I do not find him speak over well of any—so it will be more than interesting to hear something about the good and rich properties he is acquainted with, but he states that "good wine needs no bush." I want to know where, metaphorically, to get this wine from. The public have too much common sense to listen to one-sided correspondence, and I believe it is not an unusual thing for a mine that has not been profitable heretofore to become so, and *vice versa*. Appliances have their part, but discoveries make all the difference in the value of a mining property.

Your correspondent infers that the Goginan Mine is exhausted; I, for one, do not think so, and on this particular I will leave myself in the hands of miners who know how to dial, &c., and who do not deign to write highly-spiced reports. What I do think is if the investing public would find more capital for the legitimate development of mines in Cardigan, instead of so freely doing so for foreign ventures, we should soon have different results. As the case stands it costs much to get even a small capital, and too often the mines have not a chance of success. Hundreds of thousands are given abroad for an *ignis fatuus*, but let anyone ask for 20,000*l.* to work a property which has returned near upon 1,000 000*l.* sterling of ore, and see what he will get.—*London, March* 27. VERITAS.

MINING AND MINES IN CARDIGANSHIRE.

SIR,—It would be most irregular on my part to keep up a correspondence through your valuable Journal with two anonymous correspondents, and I will only state that "G. I." has entirely misrepresented facts, and it will require no word from me to show his animus in writing what he has done about the South Cambrian and the Cwm Brwyno Mines, which are opening out without exception more profitable ore ground than any other two mines in the county, and with continually increasing prospects of success. I do not like to be invidious, but I do not think, from "G. I.'s" style of writing, I should be far wrong in predicting that he expects to hatch his chickens from Court Grange and Monydd Gorddu. If so, he will be sadly disappointed, for unless a great change in every respect soon takes place he will find the hens have been sitting long enough to prove the eggs are attle. As to his having invested 5000*l.* in Cardiganshire mines, I believe it is utterly untrue, or even a tenth part of that sum, and if he has written the truth he need not be ashamed of appending his name to any reply he may contemplate making, as every honest man would not be ashamed to do.

As to "Miner" being the echo of what I write, at all events I do not invite an echo, as has been invited by "G. I." from your Salop correspondent, feeling that statements put forward truthfully will in a short time prove a sufficient echo without soliciting endorsement. No further notice will be taken of any more letters that "G. I." may think proper to write, unless his name is appended, and if he should not do this I shall be pretty safe that I have rightly guessed my man, and that the 5000*l.* he spoke of having invested exists only on paper, and that, therefore, the eggs have yet to be purchased before the chickens can be produced, and the difficulty would be in finding the means to purchase.

Goginan, March 24. ABSALOM FRANCIS.

MUTATIONS, OR "UPS AND DOWNS."

SIR,—It is generally known that most of the wealthy families in Cornwall, or their ancestors, were originally comparatively poor. There are few whose ancestry were rich; and very many of the ancient titled and other families have been reduced to a humble position. I will subjoin a few instances of "ups and downs." The Duke of Buckingham has lands in Cornwall. A few years ago his rental in several counties was 63,000*l.* per annum. By over-purchase of lands he involved his estate very heavily, and a considerable portion of it has been sold to pay the debts, or some of them, together with his household furniture. His son enjoys the residue of the estate, for he did not consent to a sale of all the lands. An ancestor of the Duke, in the last century, also wasted his estate, and died in a garret!

The late Lord Arundell held 36 manors in Cornwall, besides lands elsewhere, and several mansions; the whole of which, with few exceptions, were sold about the year 1800. The only manor in this county unsold is that of Cosgarne, in Gwennap, of which his representative, Lord Clifford, holds one-third.

The late Mr. Trevanion, of Carhayes Castle, had an income from lands of 10,000*l.* per annum, the whole of which is sold, and I believe that the name is extinct. Mr. J. M. Williams's father purchased the Castle and several of the estates for 50 000*l.*

Mr. W. Arundell Harris Arundell, late of Trebursey, near Launceston, and of Kenegie, near Penzance, had a large estate, which ultimately went into the possession (by sale) of other people. His son-in-law is the owner of Trebursey, and Mr. Bolitho is the owner of Kenegie.

The late Sir Rose Price, Bart., of Trengwainton, near Penzance, was the owner of extensive sugar plantations in the West Indies, from which he derived a large revenue. Nothing of it now remains, and I think that the family is extinct. Mr. Bolitho is the owner of Trengwainton.

Mr. Beckford, late of Fonthill Abbey, was left by his father with about one million in cash and a very large annual income besides. His father had expended 350,000*l.* upon the residence, which the son pulled down, and expended a similar sum in a new one! By extravagance and lawsuits he was reduced to spend his last days in a private lodging-house in, I think, Dawlish. He was very proud in his prosperity, and kept but little company, but he entertained Lord Nelson and Lady Hamilton!

A few years ago there was in West Cornwall a baronet who was a common labourer! He inherited nothing but the title; and a title without possessions is not a very enviable position.

Everyone who knows anything of Cornwall knows that the Williams's, of Scorrier, accumulated immense wealth from mining, smelting, &c., and still retain it. A hundred years ago their estate was about 20 000*l.*, now it is about 3,000,000*l.*!

Sixty years ago Capt. Joseph Lyle, the son of a mine agent at St. Blazey, was a poor youth. He was of a speculative turn of mind and of a sanguine temperament. He set to work North Basset, Carn Brea, West Basset, and numerous other mines, his interest in which he might have sold for, probably, 200,000*l.*, but he did not sell, choosing to hold on in the good old Cornish style. The profits from those mines he applied to the working others of the unproductive class, such as Carvannel, Wheal Agar, Bolennow, &c. However, he left property of the value of 45,000*l.* to his brother John.

Captain—or Mr.—Francis Pryor, about 30 years ago, was a miner in Pool. He speculated in shares successfully, took up setts, was manager and purser in many mines, having a salary upon the whole of 1000*l.* per annum. It is said that at one time he was possessed of nearly 100,000*l.*

Mr. E. Burgess, of Camborne, held one-third part of West Chiverton, which he sold for 60,000*l.*, or thereabout. He is now in the Gazette, as a bankrupt! The gentlemen who held the other two-thirds are very rich, but were previously very poor.

The Messrs. Davey's father was a buddle-boy, but they are very rich from successful mining.

Capt. Wm. Tengue, of Trelisk, near Truro, was a miner of superior intelligence, he is now a large landowner, banker, shareholder in Tincroft, Carn Brea, Wheal Kitty, &c.—a rich man, and likely to remain so. His new residence at Trelisk is a beautiful picture as seen from the Redruth turnpike road.

The late Mr. Robert Michell, of Truro, was always a respectable man, but he was not rich before East Wheal Rose lead mine became a prize. From this he derived about 100,000*l.*, but subsequent unprofitable adventures considerably reduced the amount, which was bequeathed to his son, Mr. Edward Michell.

There are many sharedealers in London who have acquired large fortunes by their connection with mines, among them Mr. R. Clift, Mr. Watson, Mr. Gundry, and others.

Mr. John Silvester, late of Helston, was a stamps boy. He afterwards kept a public-house, called the Star Hotel, in Helston; was the toller for Mr. Trelawny in Breage, &c.; was also a shareholder in Wheal Vor, Great Work, and other mines. He accumulated from various sources about 20 000*l.* His two sons died early. His only daughter was married to Mr. James Clarke, spirit dealer, who, with his sons, expended the residue of the estate. The family is extinct. The above are only a few specimens of the "ups and downs" in mining experience.—*March* 11. S.

[For remainder of Original Correspondence, see to-day's Journal.]

Meetings of Public Companies.

VAN MINING COMPANY.

The annual general meeting of shareholders was held at the offices of the company, Austinfriars, on Thursday,

Mr. WILLIAM PAGE, the Chairman, presiding.

Mr. W. J. LAVINGTON (the secretary) read the notice calling the meeting.

The CHAIRMAN said: Gentlemen, I did expect, until Tuesday, that we should have had Capt. Williams with us to-day, but his medical adviser forbids his coming in consequence of the inclemency of the weather. We have his report, and a map showing the state of the workings. We will dispose of the ordinary routine business first, and take Capt. William's report afterwards. I move that the report and accounts be received and adopted. Brief as the report is, I do not know that I can add very much to it. I think it contains all the information we are in possession of, but if it requires any further explanation I shall be pleased to answer any question which any gentleman may put. The accounts also speak for themselves. The only remark that I could possibly make upon them would be the working account, which shows a very considerable falling off indeed of the profits of the company as compared with the previous year, which is accounted for by the very depressed state of the lead trade during the whole of the year 1878. I think we may date the commencement in the fall of lead two years back, and during the whole of 1878 there has been a continuous fall in the price of lead, from Jan. 1 to Dec. 31. That fall has continued on for the first two months of the present year, but, I am happy to inform you, that in the present month there has been a little lift in the cloud, and that lead had advanced from 30*s.* to 35*s.* per ton. I hope and I believe that the advance will be sustained, and that in a short time it will make a further progress. No doubt the state of the weather has affected trade. Building operations cannot be carried on with anything like vigour, and the general trade of the country is, no doubt, very much affected by the extraordinary bad season which we have had—in fact, we have had not only one winter, but two or three winters. I move that the report and statement of accounts as presented be received and adopted.——Mr. F. L. SLOUS seconded the resolution.

A SHAREHOLDER asked what was the amount of expenses in connection with the new machinery?——The CHAIRMAN said they had been exceedingly heavy, but he was not able to tell them the exact amount. But they had now come to an end of all the extraordinary cost and no doubt in the present year they would make a very considerable reduction in the annual expenditure. He was quite aware that the expenses had been heavy. The directors had done their best to keep them down, but the men must be paid. There was a very good class of men on the mine, and the directors were anxious to retain them.

Mr. J. ALINGTON (a director) pointed out that the expenditure on the machinery had tended to lessen the amount of labour, and the directors expected to reduce the expenses for the current year.

The CHAIRMAN: I know of no accounts open at the time these accounts were made up All expenditure was included in these accounts.

The SECRETARY, in answer to a further question, said the expenditure on the new machinery was about 6000*l.*

A SHAREHOLDER asked whether there would be any objection to going back to the old plan of giving the price obtained for the lead month by month, instead of giving the average price per month?——The CHAIRMAN said there could be no possible objection to it, and it should be done in future.

The resolution for the adoption of the report and accounts was then put and carried.

The CHAIRMAN said the next matter was the re-election of the retiring director, Mr. J. Alington. They could not have a better man on the direction, and he worked in perfect harmony with the rest of the board. He moved that Mr. Alington be re-elected.

A SHAREHOLDER seconded the resolution, which was put and carried.

The auditor, Mr H. J. Whaley, was re-elected, with a remuneration of 10 guineas.

The CHAIRMAN said the only remaining matter was the report of the manager, Capt. Wiliams, which he would read, and Mr. Lavington would point out on the map the points referred to.

The CHAIRMAN then read the report, which was as follows:—

March 24.—As under, I beg to hand you my annual report upon this mine, showing the work done since your last annual meeting. Seahams's shaft has been sunk 2 fms, 4 ft., which is 8 ft. below the 120 fathom level. Our object in sinking thus deep was to obtain a loom for the water. The shaft has been completed to the 120, with pumps fixed, guides for cage, divisions, and ladder way A commodious lodge has been cut, and well secured with timber, on the south side of the shaft in the bastard lode. As you are aware, our rich runs of ore ground dip westward, so that the deeper we go the further we have to drive from the shaft to reach them. In consequence of this, we decided upon driving the 120 fathom level west in the bastard lode, alongside the main lode, as the bastard is much softer and speedier for driving in than the main lode. We have driven 33 fathoms. The present end is well charged with blende and spots of lead. For several fathoms last past we have cut nice stones of lead on the north side of the bottom of the level, which is a part of the main lode. We have yet some distance to drive westward before getting under the runs of ore ground before mentioned. At a point 13 fathoms west of shaft we crossed north 19 ft. 6 in. into the main lode, in which we found spots of lead and blende, but not sufficient to value. The 105 fm. level west has been extended 47 fathoms upon the main leader of the lode, and now measures 115 fathoms west of the shaft. The produce of lead in this section has varied from 1¼ to 9 tons, or an average for the year of 4 tons per cubic fathom. The lode in the present end is worth 2 tons of lead ore for the width carried. At a point about 90 fms. west of shaft we have stripped down a part of the lode to full width, which so far as seen is 15 ft. wide, producing on the average 2½ tons of lead ore per cubic fm. At a point 60 fms. west of shaft we commenced sinking a winze in the bastard, in order to afford ventilation, &c., to the 120 when is reached the corresponding point below. The 105 east has been extended 26 fms., and now measures 61 fms. east of shaft. For the last 11 fms. this level has produced lead worth 1 ton per cubic fathom. Previous to that the yield was very irregular. The lode in the present end is turning out saving work, being intermixed with lead and blende. The 90 west has been driven 36 fms. (on the main leader), and now measures 140 fms. west of shaft. The produce of the lode in this section has varied during the year from 1 to 6 tons per fathom, or an average of 3 tons of lead ore per cubic fathom. The lode in the present end is worth 3 tons per cubic fathom. At a point 120 fms. west of shaft we cross-cut and found the lode productive for a width of 19 ft. The lode has been opened to full width up to this point, being an extension of 55 fms. during the year. A winze has been sunk to ventilate the 105 at a point 100 fms. west of shaft.

The 90 east has been extended 10 fathoms by the side of the lode, and now measures 77 fms east of shaft. At a point 75 fms. east of shaft a cross cut was driven north 18 ft. 6 in. into the lode, which for the first 6 ft. was worth 25 cwts. of lead ore per cubic fathom, the remaining 12½ ft. producing saving work. A rise has also been put at this point to the 75 for ventilation. The stopes in the back of the 90, east and west of shaft, ten in number, are on the average 23 feet wide, worth 2¼ tons of lead ore per cubic fathom. The 75 west has been extended 50 fms. by the side of the lode, and now measures 212 fms. west of Seaham's, and 12 fms. west of Edwards' shaft. We have met with stones of lead occasionally in this level, but, on the whole, not worth valuing; the end at present is poor. We shall cross cut again soon to prove the width and value of the lode. At a point 166 fms. west of shaft a rise has been put up in the back of this level, and communicated with a winze sunk below the 60 for the purpose of ventilation. At 150 fms. west of shaft we have commenced to sink a winze for the purpose of ventilating the 90 when it reaches the corresponding point.

The stopes in the back of the 75, east and west of shaft, ten in number, are on the average 13 feet wide, and worth for lead ore 17 cwts. per cubic fathom. The stopes in the back of the 60, nine in number, are worth on the average 1 ton of lead ore per cubic fathom; mean width 12 ft. 6 in. The stope in the back o the 30 east is 10 ft. wide, and worth 1 ton of lead ore per cubic fathom.—Permanent Levels: The 40 fm. permanent level has been extended in the aggregate 90 fms., and now measures 19 fms. Two cross cuts have been driven to connect with the main level, measuring 23 fms. Two cross-cuts have been driven from the 75 fm. main level for the purpose of extending permanent levels, which have been driven 3 fms. east and 10½ fms. west.

Edward's Shaft: It is now time to think of deepening this shaft, and we in-

tend at our next setting to put a pare of men to rise against the shaft from the 30. This will be much cheaper than sinking, as the stuff in this way will not be sent to surface (thereby dispensing with an engine and attending costs), but will be utilised in the mine for fitting up stopes. When this is through the same course of procedure will avail at the 45 and 75 fm. levels consecutively.

Surface: All our machinery is kept in good working order. During the past year we have built a new powder magazine and dynamite magazine, and have converted the old powder magazine into a dwelling-house. We have constructed an embankment to form a catch pit or slime pit to filter the water by catching the slime before it enters the brook. This pit is about 1 acre in extent and 12 ft. deep, and answers the purpose well. We hope to see a continued improvement in the price of lead, which is about all that we can desire for the welfare of Van, every shilling of which will go to swell the dividend.—WM WILLIAMS.

The CHAIRMAN said that the report of Capt. Williams would be printed and circulated amongst the shareholders, who would thus have an opportunity of studying it at their leisure.

Mr. J. ALINGTON said he wished to thank the shareholders for having re-elected him as a director of the company. He had been one of the directors from the commencement, and should be exceedingly sorry if he had to retire. He thought they might all congratulate themselves upon the report, which was brighter than they could have anticipated three months ago. As Capt. Williams said, there was nothing to complain of in the mine, and an increase in the price of lead would give an increase in dividend. The reserves in the mine were enormous.

The CHAIRMAN said that the cost would remain the same in the event of a rise in the price of lead, and the only increase would be in the royalty.

In reply to a remark by a shareholder,

The CHAIRMAN said last year they commenced selling at 12*l.* 5s. per ton in January, and the lowest sale during the year had been at 9*l.* 15s. 6d. per ton. In future the shareholders should be furnished with the monthly price per ton.

A SHAREHOLDER enquired the length of the lease of the mine?——The CHAIRMAN said it went on for 21 years from 1869, so it would expire in 1890.

A SHAREHOLDER asked what interest this mine had in the East Van Mine?

The CHAIRMAN: The only interest we have is that we let a portion of our land on lease to the East Van Company, which has done considerable work, but has never found any lead. Of course, if the East Van were to close it would be a matter of consideration with us what we should do.

A SHAREHOLDER asked whether the East Van workings would drain this company's mine, so as to do away to some extent with the necessity for pumping?——The CHAIRMAN: The East Van are not at present doing anything on our land. I do not know whether the East Van shafts are deep enough to tap our levels.

A SHAREHOLDER: Are the reserves so enormous that you cannot work them out in 10 years?——The CHAIRMAN: Ten years is a long period to look forward to, and we hope to have the lease renewed at that time. I dare say the reserves could be worked out in 10 years if we simply exhausted what we have discovered, but that is not our policy. We hope to go on many years.

Mr. J. ALINGTON said that even supposing they had laid open no fresh ground, he believed that at the present rate of working it would take more than 10 years to work out the present reserves.

The CHAIRMAN: We are working the mine for a permanency; we are not working the stuff out so that we shall leave a shell a few years hence. I am a large shareholder, and I never buy or sell, and I am prepared to go on with them. I am quite satisfied with the mine. As to certainties, there are no certainties in mining, nor in anything else that I know of.

Mr. SLOUS said the directors and their families held more than half the shares, which showed that they had a good opinion of the mine.

Mr. HURRELL said he had great pleasure in proposing a vote of thanks to the Chairman and directors. He was sure that each of those gentlemen had the welfare of the company at heart. As to the worthy Chairman, he was a most high-minded gentleman, and nothing would induce him to swerve from the strict line of rectitude and honour. He pointed out that the large holding of the board was the best guarantee that every effort would be made to promote the prosperity of the company.

A SHAREHOLDER seconded the resolution, which was put, and carried.

The CHAIRMAN acknowledged the compliment on the part of himself and the other directors, and said he hoped that when they met on the next occasion it would be under more cheerful circumstances than at present, and that they would be able to show larger profits and a larger dividend. The directors had used their utmost endeavours to promote the welfare of the company, and it was gratifying to them to find their exertions had met with the approbation of the shareholders.

A SHAREHOLDER proposed, and Mr. KINGSFORD seconded, a cordial vote of thanks to Capt. Williams, coupled with an expression of sympathy with him in his illness, and the hope that he will speedily be restored to health.

The resolution was then put, and carried, the CHAIRMAN expressing his hearty concurrence in it. The meeting then broke up.

GORSEDD AND MERLLYN CONSOLS MINING COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Great St. Helen's, on Thursday, March 20,

Mr. FRANCIS RUDALL in the chair.

Mr. E. J. BARTLETT (the secretary) read the notice convening the meeting and the minutes of the previous meeting, which were confirmed. The printed report of the directors and the accounts were taken as read. He (Mr. Bartlett) then read the reports of the local directors and of Mr. Alfred Thomas (who has recently inspected the mine), which were as follows:—

March 18.—I have pleasure in handing you my report upon the operations carried on at this mine since the last general meeting, the present state of the works, and my opinion as to the future prospects of the undertaking. You are no doubt aware that we have been for a long time past proceeding with the development of the mine by funds derived from the sale of produce raised therefrom. The engine-shaft has been carried down a further 24 yards, and we have thrown out two cross-cuts from the bottom, one north and the other south, each a distance of 10 yards. We also extended west upon the lode a considerable distance, and intersected a north and south vein. This has been driven upon for 15 yards, and a rise put up in the roof of the level, where the vein greatly improved, and now shows splendid lead ore. By the last-named operation we raised 50 tons of lead, now ready for sale. For this parcel I lately refused an offer of 10*l.* 5s. per ton, and since then a further rise of at least 5s. has taken place, making in all an advance upon the lowest price (which was reached about a month since) of at least 25s. per ton. The mine is now looking much better than it has done for months past, and the driving west to-day presents indications of getting into open or loose ground, where the richest runs of ore have hitherto been found, and good lead is in sight. The tributers in the sump below the 20 are raising ore at 4*l.* per ton, which will pay them good wages, and the other tributers' bargains are set at the same price, the men doing well. In driving the 70 east I am pleased to say the lode has much improved during the last three or four days. The ore extends the whole height of the level, and is about 6 or 7 in. wide, with every indication of further improvement; indeed, it is the best looking vein we have yet seen in the mine at this depth, and should it continue as at present will produce lead of a superior quality at a low cost. The only thing we require is capital to continue the opening out of the mine until the price of lead has advanced to something like the old quotations, and I feel assured that we shall in a very short time be paying hand some dividends.—W. PARRY.

March 11.—In anticipation of the meeting of shareholders to be held on the 20th instant I made on the 5th day of the month an inspection of the underground workings of this mine. Before proceeding to give my report of the past and present operations, I would remind the shareholders that I have carefully watched and have periodically inspected the progress made since the advent of their success. It will not be necessary for me to trace the history of the working of the mine further back than the period at which the first important discovery was made (in the beginning of 1877). Up to that time it may be stated broadly that the operations were unsuccessful, and the company reduced to an unsatisfactory financial state. The first discovery of a valuable deposit of lead ore was made in a winze sinking below the adit level on the main or chief lode of the mine at a depth of about 52 yards from surface. The adit level, which is about 50 yards below the surface, had been driven a vast length at considerable expense, and occupying a long and dreary period of time for the purpose of discovery, but entirely without success until the period above referred to, when from certain appearances in the lode at that point it was considered advisable to sink below the adit, and the work had not been in operation for more than a few hours when a rich and valuable deposit of lead ore was brought to light. Here was a discovery made, and the object then was to thoroughly develope it, and send the ore to market in the cheapest possible way. Up to the present time I think I may say this has been effectually and properly done.

The first step was to ascertain the length of this run of ore, and another winze was sunk below the same level about 35 yards further east; here the same riches were found, at once indicating their existence uniformly in the lode between the two points. So far very satisfactory. The second step, and the more important one, was to ascertain the continuance or otherwise of this wealth in depth, and as this involved more particularly the future of the mine, it was necessary to do the work of exploration in a thoroughly efficient manner, and that was by acquiring a much greater depth, combined with the appliances and means of bringing the ore to surface in the most expeditious and economical manner. With this view it was very properly decided to sink a new engine-shaft 50 yards further east to intersect the lode at the 70 yard level, or (say) 20 yards below the depth then attained, and so afterwards to continue the sinking of that shaft through the centre of the ore-producing ground. This shaft has now reached the depth of 90 yards from surface, but the lode has not been opened upon at this depth, it having passed through the shaft at the 70 yard level above. I will now refer to the work done, and the value of the lode between the bottom of the adit level and the 70 yard level, a depth of 20 yards and a length of 100 yards. Between the above-mentioned limits the work of returning the ore has been hitherto confined, and the prospect of a continuance of success below the 70 yard level, or in other words, for the future of the mine, are of the highest order, and show no falling off whatever in the yield of lead ore. I do not think it necessary that in this report I should go into the details of the exact yield of lead ore at the different intermediate points; I will simply state that on an average the yield has been from to 2 to 4 tons per fathom for the ground removed. The actual quantity of lead ore sold from the work done amounts to 675 tons, realising about 9000*l.*

The return of this quantity of ore speaks for itself, and that this should have been accomplished in so short a time, and at comparatively so small amount of cost, proves your mine for the depth attained to be one of the most valuable ever opened in North Wales, and certainly the best of the last ten years. I need not say that the future prosperity of the mine depends upon the continuance of the ore below the 70 yard level, but of this there is every assurance, so far as any exploration has been made. As I have before stated, nothing has yet been done at the 90 yard level, and the only two explorative points below the 70 are No. 1, about 55 yards west from engine-shaft, and No. 2, about 20 yards east from engine shaft. At the first the lode yielded 2¼ tons of lead ore per fathom; at the second 1¼ ton per fathom. This yield proves what I state above—that the ore is continuing in depth, which is the most important feature for your consideration, and to which I have extreme satisfaction in drawing your attention. In driving the 70 yard level west, and at about 90 yards from shaft, the main lode was intersected by two cross-lodes, and hove by them out of its course for a distance of 7 yards, but within these intersections the lode yielded 3 tons of lead ore per fathom. This would show that the main lode is the one lode which is charged with what is most wanted—lead ore, and that you are thoroughly on the right vein for a continuance of your present success. Some side lodes or veins have been met with at different points, which I have thoroughly examined, but I look upon them mostly as tributaries of the main lode.

As regards the future working I would advise the continuance of the 70 east and west, the exploration of a side lode by a cross cut from the 90, now within a few feet of its calculated position, and the early driving of the 90 east and west, which will come in 20 yards below the present depth, and under the points now in operation at the 70, where the mine is so productive. In conclusion, I congratulate you on the present appearance of your adventure, and think the present year should put you into such a position as to make a considerable profit, and I have a firm conviction that these profits will not only be lasting, but increasing year by year.—ALFRED THOMAS.

The CHAIRMAN said, after the voluminous reports which the shareholders had heard read from the local director and from Mr. Thomas, who, in his own interest and in the interest of those he represented, had gone thoroughly into the development of the mine—he would only refer to one or two points which might require explanation. The meeting, which was usually held in January, had been deferred to the present time (quite within the Articles of Association, which gave the directors power to call the meeting whenever they felt it to be expedient in the course of the twelve months—though they were anxious to meet the shareholders as early as possible) at the request of Mr. Parry, one of the local directors, who held a large interest in the mine. Mr. Parry thought that if they deferred the meeting for a little while they would have the opportunity of announcing a further important discovery, and thus be enabled to do without further capital. The directors thought this a very important point. However, the time had come when it was desirable that this appeal should be made. Mr. Parry had advanced considerably more than it was right he should lend the company, and he (the Chairman) would tell the shareholders more particularly hereafter what this gentleman had done in the matter. This was the reason why the calling of the meeting had been deferred. The directors were of opinion that the position and prospects of the mine were very good indeed, and they believed that it would not only pay its expenses this year, but the runs they had recently come upon, and the promises of lead which they gave, would very possibly enable them to do what they had done before—pay the shareholders a dividend on the capital of the company. At the same time they had debts to provide for, and it was desirable that they should commence the year's account with a clean bill of health. He would, therefore, at a later stage of the proceedings propose one of the two resolutions of which notice had been given to the shareholders. He (the Chairman) then proposed the reception and adoption of the reports and balance-sheet, and said that Mr. Bartlett, who had recently visited the mine, would add a few words in reference thereto.

Mr. E. J. BARTLETT said that the report which he had been privileged to read from Mr. Thomas was most comprehensive, and it showed the great interest which that gentleman had taken in the mine for himself and his clients. It would be noticed that the lead sold since the company had been started—or rather since the discovery had been made—had realised 9008*l.* 4s. 4d.; but it must be recollected that before they were enabled to return that lead to the market they had incurred a considerable debt, and having no funds in hand they, of course, had to depend entirely upon the produce of the mine to continue the development of the property. In addition to this the shareholders received 1818*l.* 10s. by way of dividend, a splendid engine had been purchased (at very little more than cost price), which, together with the pumps, cost them 879*l.* 18s. 5d., and the shaft had been carried down 24 yards, to give the mine a steady development. The Chairman had explained why the meeting had been postponed. It was, of course, most desirable if the improvements in the mine continued, and the prices of lead ore advanced, that they should try to avoid increasing the capital of the company. As the Chairman had stated, Mr. Parry suggested the postponement of the meeting; but in the meantime the Chairman, Mr. Parry, and himself had put their hands in their pockets to meet the little deficiency shown in the balance sheet. The position of the mine at the time was decidedly different from its position at the time that the report was made. The 70 east, which they were enabled to put men to drive, had considerably improved, and he should say that the value of the end was from 2 to 3 tons of lead to the fathom. The 70 west, as Mr. Thomas had explained in his report, had considerably improved within the last fortnight, and it appeared that as advancement was made upon it the lode was becoming more defined, and the ground was easier to work than it had been. Questions had been raised by one or two shareholders as to why the 70 east was discontinued. Seeing how severely lead had fallen the local director thought it desirable that the end should be stopped; but the men had now been placed there again, as the directors promised, and not only did the lode continue to be of as high a character as in the upper level, but there was every reason to hope and believe that the lead in depth was becoming stronger—(hear, hear)—so that the prospects of the mine were extremely satisfactory. To show how it had improved since the report, dated March 8, was issued he might mention that they had now 60 tons of lead ready for market instead of 50 tons—(hear, hear)—and that instead of accepting the offer mentioned in the report of 10*l.* 5s. per ton, they could get 10*l.* 10s. if not 10*l.* 15s. per ton if they sold the lead now. (Hear, hear.) It would not be difficult, if thought expedient, to double or treble the number of tributers; but while the price of lead was so low the directors thought that it would be very undesirable to exhaust the mine, and, therefore, they only endeavoured to make the returns equal the outgoing expenses. They could now see the advantage of the rise in the price of lead, and its effect upon the position of the company. Of course, some people said that prices were not going higher, but he was inclined to think that, at all events, 12*l.* per ton would be reached. The position of the mine had improved very much indeed, and they could raise a considerably larger quantity of ore so soon as the market justified them in doing so. If there were any points upon which the shareholders required information he would be very happy to give it. —Mr. ALFRED CONDER seconded the motion for the adoption of the report and accounts.

Mr. JOHN RUSHFORD said: On reading over the directors' report he felt impressed that it was his duty as a large shareholder to comment at some length on the past year's working of the mine. He might mention that the shares he held had cost him 1869*l.*, which was equal to one-tenth of the share capital of the company. In times of depression, when scarcely anything was paying, no one sat down with greater resignation than himself, after satisfying himself that the concern in which he was interested had been properly managed. The past year had been one of very great depression, but for the last few years lead had not suffered so much as some other metals had—notably iron. In connection with this mine lead had fallen something like 3*l.* per ton; that was between August, 1877, and December, 1878—the prices realised at those dates being respectively 13*l.* 10s. 6d., 13*l.* 8s. 6d., and 10*l.* 2s. 6d. per ton. This appeared to be a very small falling off if the reduction in wages, royalty, and other expenses were taken into account—indeed, he thought they should be in as good a position as if the selling prices of lead had remained at the rates received in August, 1877, when the first and last dividend was paid to the shareholders, and many people were induced to take shares at a high premium. At the time he took his shares he was told that the returns were 50 tons per month, and that in all probability they would soon be doubled—that the cost of raising the lead was comparatively small—(hear, hear)—and upon that statement he invested so largely; but what had been the result? He thought that was a matter that should be enquired into. (Hear, hear.) He thought the shareholders should have been called together six months ago, and not left without a meeting for thirteen months. For the whole of the year 1878, instead of returning 600 tons of lead, which with blende would have brought in about 7000*l.*, they had sold only 113 tons 16 cwts., leaving 486 tons 4 cwts. as the falling off, which represented a money deficiency of 5612*l.* 18s. 8d. He need not say that not only had the whole of the money received from the sales of lead, amounting to the sum of 1283*l.* 19s. 4d., been swallowed up by the expenses connected with the mine, but they had also spent the whole of the balance of capital, which at the commencement of last year represented a sum of 1171*l.* over the liabilities, and in addition to this they were landed in debt to the extent of 945*l.* 12s—called in the balance-sheet, balance of liabilities over assets, and they were informed that in consequence of the fall in lead operations upon the ore ground had been curtailed. It was non sense to tell them that, and he thought the affair had been badly managed. The secretary had spoken about the management, but there were two ways of looking at bad management—the first was by deliberately robbing a company; and the second was by the management not being capable of dealing with the difficulties they had to meet; and it was with regard to this latter state of things that the board had exhibited a great amount of incompetency. He decided upon sending an engineer at his own cost to examine and report specially on the Gorsedd Mine, and then the question arose, Who should he employ? He thought mine captains, as a rule, did not, unfortunately, stand very high in the estimation of the general public. However, he was fortunate in getting an introduction to Capt. Plummer, who had had 35 years' experience as a practical mining engineer. He had visited Ireland for the last 25 years as a mining agent, and inspected and had also been connected with North and South Wales for a period of 20 years as resident agent first, and, secondly, as inspector; and he had had experience of the limestone formation similar to theirs for the last 15 years. Capt. Plummer had also been employed by Messrs. John Taylor and Sons for the last 20 years as a mining inspector at home and abroad. When Capt. Plummer arrived at Gorsedd Mine he was treated courteously and with every respect, and he (Mr. Rushford) was sure that everybody who had anything to do with Mr. Parry would say that he was courtesy itself, and gives his advice honestly and straightforward—it was not with Mr. Parry that he had to find fault, but he thought it was a burning shame that the directors did not provide a better man to work under him. Capt. Plummer naturally asked to see the plans; he was told that there were none, and that the mine was worked without any. Was that good management?

A SHAREHOLDER: That is a matter for the captain, I should think.

Mr. RUSHFORD begged pardon; it was for the board to see that a proper system of management was adopted. Capt. Plummer made a plan of the underground workings, and came to the conclusion that the mine was a very valuable property—(hear, hear)—but that it was badly managed. (Oh!) With respect to the rediscovery of the 70 west he said—"The lode has a very promising appearance; it is from 3 to 4 ft. wide, made up of clay and limestone, in which very hard lumps of galena are found. Though this is a new run of ore it is not a new vein; it is a continuation of the old lode heaved a few feet to the south by the influence of the north and south lode." Capt Plummer was also of opinion that when the shaft was sunk to the 90, which was achieved last September, they would be able to raise 50 tons of lead ore per month, and so Mr. Bartlett told him when he was in London last August. Instead of that being the case, they left it, having the idea that it was not the main lode.——Mr. BARTLETT: No, Sir.

Mr. RUSHFORD: Because it appears to be pinched up to something like 12 in., they go in search of something else not specified—this is in the north cross cut of the 90—and thus leave our fine old lode because it is pinched up—(No)—and men are put to work in the 70 east, as shown in the rough plan which Capt. Plummer gave me with his report. It seemed to him that they were carrying off the only reserves in the mine at the time that those reserves fell off. He thought if a different policy had been adopted they would within a very short time have been out of debt, and be receiving a dividend. Mr. Thomas had many times visited the underground workings, and had condemned the management (Mr. Thomas dissented). Well, he had asked for a better manager, and they were given to understand that this would be attended to; but he regretted to find that this had not been done, although their capital was now spent. He was aware that the secretary often went down to the mine, but he thought the directors should take the responsibility off Mr. Bartlett's shoulders, and put it upon those of a practical miner. Referring to the balance-sheet the small amount of 480*l.* 4s. 10d. was charged to the underground mining account, and if that was not an error the management was more defective than he took it to be. In all well-conducted mining operations it was understood that the great bulk of the expenditure was upon the exploration and abstraction of ores—about two-thirds of the whole cost should be devoted to these operations; but with the small proportion of 480*l.* 4s. 10d., instead of over 1500*l.*, spent on underground workings—(Mr. BARTLETT: Mr. Rushford is altogether incorrect)—it was very doubtful whether the best mines in the country could be made to pay. The sinking of shafts and extraction of ore should be carried on simultaneously, but this did not seem to have been the principle adopted here. He thought the mine should be worked on its own merits, and such ore as they had should be sent to the market—50 tons of ore at 10*l.* 10s. per ton would bring them 525*l.* for the month, which represented a profit of 3000*l.* a year. He hoped the directors would not appeal to the shareholders in these hard times for more capital, and he did not think they should ask for such a paltry sum as 1500*l.* (Laughter.) If the mine were worked as it should be, this debt would be soon paid off, and the property would yield a good profit. He would ask, Where are the runs in the upper levels, spoken of in the report? and of what value were they? What were their reserves in the 70 west end and the 70 east end respectively? and also what were the reserves in the tributers' workings between the 70 and 90? How did they propose opening them out, seeing that they had failed in the 90 cross-cut north? He would also like to know whether there were any reserves in the mine not previously stated, and what was intended to be done with the long cross cut in the west end of the mine?

Mr. BARTLETT said the Chairman had given him permission to reply to some of the points raised by Mr. Rushford.

Mr. CONDER thought before Mr. Bartlett replied it would be well to ask if Mr. Rushford was himself a practical miner, as the value of his observations would much depend upon the practical knowledge that he could bring to bear on this subject.——Mr. RUSHFORD replied that he was not a mining engineer, but he had a general knowledge of many things; and he was in the habit of making very full enquiries into the position of mines in which he was interested. He had gone to a good man for information, and he had given it to the shareholders just as he received it.

Mr. BARTLETT said he had the character of putting himself out of the way to afford every information in his power to enquiring shareholders to answering all letters punctually. (Hear, hear.) The whole of Mr. Rushford's observations seemed to hinge on one thing—he was dissatisfied with the agent at the mine, Capt. Edwards, for he commended and approved of Mr. Parry as managing director. Mr. Parry held 1933 shares in this company, some of which had cost him 5*l.* each; and if he, holding such a large interest, was satisfied with Capt. Edwards he thought the shareholders had reason to be satisfied also. Mr. George Hughes, the other local director, also held 1039 shares, and it was upon his recommendation that Capt. Edwards was appointed. Capt. Edwards did not, perhaps, write good reports, but he was a thoroughly conscientious and practical miner. (Hear, hear.) Without thoroughly understanding the limestone formation it was most difficult for anyone to come into a neighbourhood for a short time and to go away, even after a very careful inspection, and say whether the mine had been properly or improperly worked. Capt. Plummer may have had considerable experience, but Capt. Edwards had had more than 30 years' practical experience, and had worked himself up from being a tributer. He (Mr. Bartlett) had put this question to Mr. Parry—"It has been suggested by a large shareholder (Mr. Rushford being the suggestor) that there should be a change in the management."

Mr. RUSHFORD was perfectly satisfied with Capt. Edwards and Mr. Parry, but he thought they wanted the addition of a valuable mining engineer.

Mr. BARTLETT said evidence must be given that the man was not capable before any such expense should be incurred. It was Capt. Edwards who assisted to make the discovery, and when the shareholders looked at the money that had been derived from it and the application of the funds he did not think they could point to another such success, or to a property more honestly and legitimately worked. Neither the local directors nor himself thought it necessary to have additional management; but a gentleman—Mr. Prince—had been appointed to prepare records of workings, &c., and who would be on the mine during the afternoon of every other day, to see to the plans and accounts. As to not sending the ore to market, he would ask who was the most interested in that? At the last meeting it was suggested that a testimonial should be given to him for his services to the company; but he refused everything, because he believed the mine had then done only a very little of what it would do. With regard to the accounts, Mr. Rushford was entirely in error in referring to the apparently small amount shown in the balance-sheet for underground operations. There were two accounts, the capital and the profit and loss, and in the capital account they had placed certain expenses which were not fairly chargeable against the returns of ore. (Cheers.) It would be seen that up to the end of December last 4329*l.* had been spent on "general development, shafts, levels, and other permanent works." The directors had endeavoured to obtain a reduction of the amounts the company has to pay for rates and taxes, but their efforts in that direction had hitherto been unsuccessful.

Mr. MACKESON, Q.C., thought the directors ought to be be very much obliged to Mr. Rushford, for the secret of a strong government was a strong opposition. He thought they might say they had that now in this company. The value of the mine, the skill of the manager (Mr. Parry), the economical management by the directors, and the earnest and practical character of the secretary, were admitted facts. The object of his observations was twofold; in the first place, he wished to urge upon the directors that it was not wise to curtail the raising of the ore merely because of the price of lead, and, secondly, that they ought to be content with smaller profits rather than stop the operations of the mine. (Hear, hear.) In 1877 he found there were raised 500 tons of ore, and in 1878 only 120 tons. In 1877 the year's operations—striking out extraneous matter—showed a profit of 3871*l.* 2s. 8d., and in 1878 the operations showed a deficiency of 757*l.* 3s. On the other hand he would contrast the capabilities of the property in the two years. In 1877 the only upper level from which they raised 7000*l.* worth of lead was the 50 yard level, which he himself examined—indeed, it was after seeing what was called the "Jewel Chamber" that he bought his shares. In 1878 they not only had this level but also the 70 and 90 yard levels, besides odds and ends here, there, and everywhere.——Mr. BARTLETT: There is no 90 yard level yet.

Mr. THOMAS: The shaft is sunk to that depth.

Mr. MACKESON said so far as the 50 yard level was concerned he was told that the forebreast towards the east and west presented as strong an appearance then as it had ever done, and he supposed it was as strong as ever. They had heard that the 70 yard level was capable of producing a great deal, and they were told last year instead of 50 tons they would have 75 tons per month. He had no criticism to raise against the development, which he found had cost, on capital account, 1128*l.* during the year. The reason given by the Chairman at the last meeting that they could not rest with only one level was conclusive, and they were wise in sinking and driving other levels. (Hear, hear.) Again, he had no objection to the cross-cut 500 yards west of new shaft, but he thought they were entitled to some explanation with regard to it. In last year's report they were told that although the lode had not been discovered it was very near being so, and that it would almost double the value of their shares if it were successful. What had been the result in regard to that? They had a liability to meet of 945*l.* 12s. instead of having the balance in hand from the last statement, amounting to 1193*l.* 3s. 9d. What was the reason of all this? To his mind it was very simple indeed—it was because they had not raised enough lead. (Hear, hear.) He was aware that dead work was absolutely necessary, but it should be kept up by live work. But this year they had not raised enough lead to pay the fixed expenses, and if this system were pursued the effect would be suicidal. Raising ore was one thing, but selling it when raised was another. He did not advise them to sell lead while prices were very low, but if it were raised they could take advantage of improvement when it happened, but instead of this they had no lead ready for market, or very little, and they would have to put tributers on at, perhaps, double the proper rate to get it quickly.

Mr. BARTLETT: I beg pardon: we should not have to advance the price at all.

Mr. MACKESON remarked that he never knew a mine in which the fixed expenses were so small for directors, secretary, office rent, &c. (Hear, hear.) But these had to be met. He would like to ask the directors whether they had any serious doubt that they could not raise 750 tons per annum. The mine had very much altered since his last visit if such a doubt were possible.

Mr. A. THOMAS said Capt. Plumer accompanied the agent and himself under ground, and the only fault he found was that the eastern level (the 70 yards level) was not being driven at the same time as the shaft was being sunk. In that he quite agreed with Capt. Plummer, and he asked Capt. Edwards why it was not being done. The reply was that his instructions were to sink the shaft direct from surface, and so draw the stuff direct, instead of going to the expense of putting up a pent-house to sink under. The result of that was that they could not draw the stuff from the other levels when the men were working in the shaft, and as it was so desirable to get the shaft down, the management thought this was an essential point, and so it was; but it necessitated the stoppage of some of the stopings, and it was found desirable to stop the eastern end. The western end was being driven all the time, and Capt. Plummer said that it was producing solid lumps of galena; it would produce 3 tons of ore to the fathom, and it was very easy for driving. They were unanimous in the opinion that the operations should be more extended, and he told Mr. Bartlett so. Mr. Bartlett met him at the mine, and after a consultation decided to continue the eastern end of the 70, and drive a cross-cut at the bottom to catch what was called either the new lode, or a branch of the lode. This was now being done—(hear, hear)—and, therefore, if the least fault had to be made with the past it had been rectified, and he did not believe that the mine could be worked better than it was being worked at the present time. There were three stopes going on, from which the men were raising lead at 4*l.* per ton in the hardest part of the mine; but he thought it would be a great pity to have to sell the lead. If they raised it they must pay for the labour by selling it. He was of opinion that lead would have a great rise, and he thought it was better to go on breaking the lead, but not selling it. When times were bad it was usual to sink shafts and drive levels, for it was easy to take away the lead when once laid open. In different parts of the mine there were hundreds of tons of ore to be taken away. As to interfering with the management, if the shareholders were not satisfied with the directors they should call a meeting and turn them out. He had the fullest confidence in the directors, the secretary, and Mr. Parry, and as to appointing another manager that was a matter for the directors to consider.

Mr. THOMAS, in reply to a question, stated that the 70 and 50 yards levels would become one by stoping.

The CHAIRMAN said there was every reason to believe that the property would take another start, and that they would have a much better year this year than last. As to having a management within the management, he thought that would be very undesirable. Mr. Parry was an old miner, and he was consulted every day by Capt. Edwards, in whom he had perfect confidence. Every suggestion made to the directors was carefully considered, and he believed that they would soon be raising 100 tons a month.

Mr. BARTLETT expressed his desire to afford Mr. Rushford the fullest information with respect to every item in the accounts.

Mr. RUSHFORD quite believed that, and was highly and thoroughly satisfied with the services of the secretary.

The reports and accounts were then unanimously adopted.

On the motion of the CHAIRMAN, seconded by Mr. WILLIAMS, the retiring directors, Messrs. T. F. Gamble and G. Hughes, were re-elected, and on the motion of Mr. Rushford Mr. A. Conder was re appointed auditor.

The meeting was then constituted extraordinary, and after a few remarks with respect to the financial position of the company the CHAIRMAN moved "That the share capital of the company be increased by the creation of 1000 additional shares of the value of 2*l.* 10s. each, and that such shares be offered at par to existing shareholders *pro rata* with their present holdings."

Mr. WILLIAMS seconded the motion.

Some conversation took place as to whether additional shares or debentures would be the better way of raising the capital, and Mr. BARTLETT remarked that the mine was now more than paying its expenses, and the directors would use their discretion as to the issue of the shares and the calling up of the amount due upon them, as the funds were not so much required as when the notice of the resolution proposed by the Chairman was given.

Mr. MACKESON, Q.C., did not think a better or more practical mining authority could be found in London than Mr. Bartlett, and he would rather take his opinion than that of most so-called practical miners. (Hear, hear.)

Mr. THOMAS said he visited the mine at short intervals, and he would be happy to issue a report of his observations to the shareholders, but he certainly would not accept any intermediary position between the managers and the directors.

The motion was carried *nem dis.*

Votes of thanks were passed to Messrs. Parry and Hughes, the local directors, to the Chairman and directors, to Mr. Bartlett, and to Captain Edwards.

The proceedings then terminated.

LLANRWST MINING COMPANY.

An important meeting of shareholders was held at the mine on Saturday last, under the presidency of Capt. GILBERT, the Chairman of the company, and there was a large attendance of shareholders.

Mr. CARTER read the notice convening the meeting.

The CHAIRMAN said—Gentlemen, the duty that devolves upon me now is to move the adoption of the report and balance-sheet, and it is not a very agreeable one, inasmuch as it will be unaccompanied with the pleasure of declaring a dividend. We cannot deny—at least your directors cannot—that so far they have been disappointed in the results which have flowed from the working of the mine; but in saying this they must not, and they do not, forget that during nearly the whole of the existence of this company there has been a fearful, an unexampled, depression in trade, and more especially in that branch of it which has to do with the sale of metals. Lead, with which, of course, we have to do, has decreased in value to an extent that has not been known for 30 years; and under these circumstances I think we are rather to be congratulated that we have kept ourselves tolerably abreast of this adverse tide when so many other similar concerns have been submerged. (Hear, hear.) Of course, with lead so low as 8*l.* per ton it was utterly impossible to attempt sales. They could only have been made at a loss—in other words, we should not merely have raised our produce at a loss, but paid the people who bought it a premium to take it away. Under these circumstances you will doubtless be of opinion that the directors exercised a wise discretion in retaining that produce for better times, and for an improved market. That in itself, had the underground operations realised our best hopes, would have prevented us being prosperous, but unfortunately the anticipations of Capt. Knapp that good returns would be made have to a great extent failed, from causes which he has explained, but which we hope may be only temporary. Capt. Knapp is here, and will furnish you with all the necessary details, and the fact that he has already submitted for your consideration a voluminous report renders it unnecessary that I should dwell further upon this subject. I do not know that there is much more that I need say to you, more particularly as we have a special resolution to occupy our attention at a later period of our proceedings. We have been exceedingly anxious that there should be a large attendance of shareholders to-day, and for that purpose we have allowed a full hour's grace before commencing the proceedings. In the event of your requiring further information than that set forth in the various reports, I shall be happy, with the assistance of the secretary and Capt. Knapp, to answer any questions you may wish to put. He (the Chairman) concluded as he began, by moving the adoption of the report and balance-sheet.

Mr. BANTOCK seconded the motion, which was carried unanimously.

The CHAIRMAN: The next business is the appointment of a director. Mr. Helden, who has been associated with the mine from its commencement, retires by rotation, but offers himself for re election. I have great pleasure in saying that during the time I have worked with Mr. Helden his co-operation and support have been most valuable to me, and we have conducted affairs in the most harmonious manner. He has given undivided attention and, I may say, continuous service to the company, the benefit of which will be realised by the shareholders I trust at a period not far removed from the present. He is known to most of the shareholders, and the additional fact that he is now present renders it undesirable that I should further dilate upon his merits.—Mr. GREGORY seconded the motion, which was agreed to *nem. dis.*

Mr. HELDEN, in returning thanks, reminded the meeting that important business had still to be transacted, and therefore he would in the briefest possible manner thank the Chairman for the kind way in which he had proposed his re-election, and the shareholders for the cordial spirit in which they had received and passed the motion. It was a proof of their confidence in him, and its remembrance would, if possible, stimulate him to greater exertions for the company in the future than he had put forth in the past. He had been associated with the mine from the commencement, and nothing would be a greater pleasure to him than to see the shareholders in receipt of a substantial dividend. (Hear, hear.)

A SHAREHOLDER then proposed the re-election of the auditor—Mr. Henry Swaffield—at the reduced remuneration of 10*l.* 10s., it being understood that it would be raised should the prospects of the company improve.—Mr. GREGORY seconded the motion, which was unanimously agreed to.

The CHAIRMAN: Since our last meeting Mr. Shelton has found it necessary to retire, in consequence of having other duties which absorb all his time. We were so fortunate as to obtain for his successor Major Nesbitt, a gentleman who has favoured us with his presence to-day. I think it desirable that his appointment should be confirmed.

Mr. ALFRED ENDEAN: I shall be glad to second that proposition. I have no doubt as he finds time go on he will be glad to participate in the prosperity of the mine, whilst he will earn the gratitude of the shareholders for the interest he takes in its management. (Hear, hear.)—The motion was agreed to unanimously.

Major NESBITT, in replying, thanked the Chairman and Mr. Endean for the terms in which they had submitted this motion, and the meeting for carrying it. He could only promise to do all that lay in his power to promote the company's prosperity.

Some discussion then arose on the subject of remuneration to the directors, when the CHAIRMAN, with the full concurrence of his colleagues, at once consented in the most ready way to a reduction of the amount to 200*l.* between them, and it further transpired that they had only taken half the amount voted to them, and which appeared in the balance-sheet.

The meeting was then made extraordinary to pass the special resolution, of which notice had been given.

The CHAIRMAN, in proposing it, said: The position of affairs as regards the company's capital has been made pretty generally known to the shareholders, and, therefore, it will not surprise them that we have to come forward now, and tell them that that capital has been expended. They became aware of this, of course, when the donation of shares was generously put forward by the administrators of the late Mr. Endean, and the money raised from them has been very carefully utilised for the simple purpose of proceeding with those drivings and sinkings which were recommended not only by Capt. Knapp, but by the gentlemen specially sent down to report upon what was thought desirable should be done at the mine, having regard to the fact that the returns were not equal to what the shareholders expected. The position is such now that we must come forward and ask for certain capital. It has been intimated to us that it is requisite we should have 10,000*l.*, and for that purpose we are called together at this special meeting to decide by which course it is best to raise it, and I should be glad to hear the opinions of the shareholders on the subject. At the same time I shall not withhold the view the directors take of what is the most desirable way of raising the money, and before actually putting it in the shape of a resolution to the meeting, I will explain that we think capital might be procured by means of preference shares at a certain rate of interest, to be determined by the shareholders at the present meeting. I may explain here the general reasons which induce us to feel that we shall not merely obtain the money we require, but bring the mine to its original market price. In the first place, there has arisen a wonderful demand for lead in America, which has advanced the price of the metal there, and had a reflex benefit upon our own produce. Indeed, I am told that in America lead has nearly doubled in value within a very short period. It was selling at 2½ cents per pound—it is now 4 ¼ cents. As an instance of the rise in the price of lead, I may quote from Von Dadelszen's Weekly Metal Reports of March 8 and March 15; in the former report English pig was quoted as 13*l.* 15s., and in the latter at 14*l.* 15s. to 15*l.*—a rise of over 20s. in a week. Then a considerable amount of the competition we formerly experienced has been abolished by the stoppage of many of the German and Spanish mines. The low price of lead has had such an effect upon them that they have closed their workings. I am credibly informed that in the Hartz Mountains, and in the inland districts of Spain, where there is such difficulty in getting the ore to the seaport, the reduction in lead has had such an effect that the mines have been closed, and there is little likelihood of their being re-opened. Now, that all tends in the direction of a satisfactory price for lead from the mines in Wales. (Hear, hear.) I think you will be of opinion that the shareholders will do well to subscribe for the preference shares we propose to put forth, not merely because of the promising condition of their own mine, but on account of the circumstances attending its workings being so much more favourable than they were formerly. With regard to the rate of interest, I incline myself to 7½, for it is possible that the shareholders may not feel disposed to come forward, in which case we should go to the outside public. Upon this point I should like to hear some discussion before proposing the formal resolution.

A SHAREHOLDER: Before proceeding with the discussion referred to by the Chairman, I should like to ask Capt. Knapp a few questions, more for the benefit of absent shareholders than for my own. At the last meeting a certain sum of money was raised to prosecute certain points, particularly a deeper level, from which you and all who inspected it anticipated very favourable results.

Captain KNAPP: That is correct.

A SHAREHOLDER: And the deeper level turned out unfavourable?—Capt. KNAPP: Yes; we have been disappointed.

A SHAREHOLDER: Many shareholders do not understand agents' reports, but would put the plain question to you—Is there any cause for the falling off in the value of the lode?—Capt. KNAPP: I think it is only temporary. There is a horizontal pinch in the lode. I have seen such an occurrence before in the best lead mines of the country.

A SHAREHOLDER: Are the lodes strong and masterly, such as in your opinion would make rich in depth?—Capt. KNAPP: They are increasing in size, and I have not the slightest doubt but that the level below the 14 will be as good as the indications promised it should be.

A SHAREHOLDER: Is there any improvement in the quantity of the ore in the deeper part as compared with what you find in the shallower part?—Capt. KNAPP: It is a higher percentage. The matrix is better, and there is less mundic.

A SHAREHOLDER: Is there any mine in this district where the workings have been prosecuted to a greater depth?—Capt. KNAPP: No, I think not.

A SHAREHOLDER: Then you say that Llanrwst is the pioneer mine of the district?—Capt. KNAPP: It is the leading mine. The Pool is very much deeper.

A SHAREHOLDER: What is the character of their stuff?—Capt. KNAPP: Very much like ours—free from mundic, crystallised carbonate of lime, and some quartz—the best constituents.

A SHAREHOLDER: You think if further capital were raised you are perfectly justified in sinking another 20 fms.?—Capt. KNAPP: Most decidedly so.

A SHAREHOLDER: In a new neighbourhood like this 20 fms. is not a great depth. There are many neighbourhoods in which the mines have proved rich shallow, and from some explainable reason have frequently been abandoned by the companies, and afterwards taken up and then abandoned again, and after sinking 10 or 30 fms. they have come upon valuable courses of ore.

Capt. KNAPP: All the mines in West Cornwall have been subjected to that kind of ordeal, but there is nothing in the appearance of our deeper level here to induce the slightest doubt in the mind of any man who understands the character of such lodes to think this other than a pinch up, but we have felt it more because we had no other level to support it. Our adit will average a depth of 20 fathoms, and in working upwards the lode is sure to decline. The ground has never been without lead, and rather hard, and in consequence of that the ores in the adit were not available. It would never do to work the stopes underhand, as this would increase the cost 100 per cent. As far as the lode is concerned, in the western part of the 14 its character is increased tenfold in quality, and the lode is two or three times as good at the 14 as it was in the adit. We have it 6 or 7 ft. wide, and we do not know how wide it is—evidently showing that all we require in this mine is depth. We are in a mountainous country, and these large and continuous pinches that we have are quite exceptional. I have never seen a lode so continuously productive in such a situation. The ground is freer for working, and the lead purer. One thing that has conduced to the comparative impoverishment of the lode at the 14 is the fact that we have found the lode is divided. Both lodes are productive, and the ground is easy. At the time of the last meeting we had only recently cut into the lode at the 14, and Capts. Lean and Kendall said it was like an ashen heap. Half a dozen men could have supplied sufficient ore for our crusher, but in less than 3 fathoms we got into hard ground, which cost us so much more to get through. Latterly the lode has greatly improved, but we find that we have it in two parts instead of one. We have just commenced breaking into the south part, and discovered that the winze has gone down, standing entire in the lode at the 14, in Endean shaft, that I have reported on. The two parts of the lode will join again in depth I have no doubt, and if betting were legal I should like to take a bet upon the fact of the next level turning out as good as the other one.

A SHAREHOLDER: Are there any other points you would like to see thoroughly developed?—Capt. KNAPP: I would like to develope the adit. We have a lode 2½ tons to the fathom.

A SHAREHOLDER: What length have you got to drive to get to your boundary?—Capt. KNAPP: 40 or 50 fms. I am sure that the lords will give us every assistance that they can.

A SHAREHOLDER: Can you give me any approximate estimate of the amount of additional capital that will be required to push the adit, to sink the shaft (say) 25 or 30 fms., and, in fact, to develope all the promising parts of the mine? In mining money makes money, and if we had the money we wanted we should be further advanced. We had better have enough now, for to inflict a similar state of things upon us now to that which we have already experienced from want of capital would be a gross act of folly.—Capt. KNAPP: I think you ought to have 10,000*l.* This would put you in really good circumstances.

A SHAREHOLDER: I have had very straightforward answers to the questions I have put, which I say again have been asked more for the information of absent shareholders than on my own behalf. The answers confirm my previously conceived opinions that in depth you will have a great mine. I should think there has been no company so well abused as the Llanrwst. A set of adventurers have endeavoured to frighten the shareholders, and unfortunately, aided by the low price of metals, have succeeded only too well in depreciating the market value of the property very considerably, but what I wish the shareholders to reflect upon is not what may be the price of their shares to-day, but what is their probable value when the mine is fairly developed. We have the report of our own agent, but I should suggest, and it would not cost much, that some other experienced man should be called in to inspect the property, to give additional confidence to the shareholders who have been so terrified by the divers communications they have received.

The question of royalties having been raised by Major NESBITT, Capt. KNAPP said he thought an application for a reduction would be favourably entertained.

Mr. ENDEAN: What amount of ore have we now ready for the market?—Capt. KNAPP: 25 tons.—Mr. JONES: I see the entry "Proceeds of gifts of shares from the estate of the late J. P. Endean, 1940*l.*" How were these shares disposed of?—The CHAIRMAN: They were taken up by the shareholders.

Mr. GREGORY: I think the best course for the company to adopt in the present circumstances is to issue these 10,000*l.* worth of preference shares amongst the shareholders, and I cannot think that any of them will hesitate to come forward, save those who have had their minds prejudiced against their property by certain persons who, having very little business of their own to attend to, have employed their time during the last 18 months in sowing distrust and want of confidence amongst the Llanrwst shareholders. As a consequence of this many of them have got rid of their shares at considerable loss, and have been led to look upon the mine as a myth. Those who are present to-day will probably be of opinion that never did a myth assume a more tangible shape when they have regard to what they have seen upon this mine. They will take away the impression that they have looked upon something which gives their shares a most substantial value. If the shareholders find the money required I have not the slightest doubt that long before it is expended they will have it paid back to them in dividends. I consider that we have in this property one of the best mines ever opened in Wales, and I do not care where you go to find it. Compare in depth Llanrwst with Van, Roman Gravels, or Minera, and I confidently await the result. (Cheers.) Llanrwst is only developed to a depth of 3 fms., and yet after five years' working it has shown results that will compare favourably with any other mine in the Principality; in fact, with the whole of the United Kingdom. We have up to the present time returned 4000*l.* worth of lead, and we have lead discovered in the mine which, if valued at the market price when the estimate was made, is worth 17,000*l.*, but if valued now (lead having gone up nearly 2*l.* a ton) it is worth considerably more than that. If lead advances in the same ratio that it has been doing during the last week or two, and I have no doubt it will, there is no improbability in the supposition, but quite the reverse; there is nothing I can see to prevent Llanrwst resuming its sales of ore, and selling that ore at a substantial profit. In mining shareholders are apt to overlook the fact that it is always a matter of time to explore and lay open their property in a miner-like manner, and here I must say I believe Capt. Knapp has done his utmost during the time he has had the management to lay it open in such a manner that it shall not be a mine simply of to-day or of to-morrow, but of the future—a mine that when it does commence to pay the shareholders (and I feel satisfied that if they have a little patience they will participate in its benefits), it will be a property that will repay them well for the patience they have exercised, and the money they have subscribed in order to bring it to a successful issue. I think the shareholders will be exceedingly remiss and unmindful of their own interests if they allowed this opportunity of increasing their holding by way of preference shares to pass, or allow their minds to be prejudiced by the communications of certain persons who have their own motives to serve. I feel that these remarks are necessary, though they are personal. (Hear, hear.) It has happened very recently that the shareholders of Llanrwst Mine have been flooded with a volume of communications emanating from the prolific pen, and no less prolific press, of certain individual whose name I forbear for the moment to mention, and in that communication he has thought it advisable to refer to me personally. His object in doing so is to gratify the feeling of personal animus he entertains towards me. In this effusion he has also thought fit to refer to the Llanrwst Mine in very disparaging terms, and moreover he publishes those two reports from certain mines, called respectively East and West Craven Moor, placing the said reports in juxtaposition with one from Capt. Knapp, taken recently from the mining papers—the object being to laud East and West Craven Moor, and to depreciate Llanrwst Mine, but since that communication reached them the shareholders have been placed in possession of Capt. Knapp's latest report, which is thoroughly exhaustive—the other one not pretending to be so; and now I would ask the shareholders to compare the last report with those of East and West Craven Moor, and form their own opinion as to the respective value of the three properties. He thought fit in the course of his circular, and with reference to Llanrwst Mine, to advert to the fact that Captain Knapp had got a discovery of "sugar spar." I think when we come to look at his report, and see that we have 17,000*l.* worth of lead in reserve, that this is a discovery of "sugar" that may well cause the mouths of the East and West Craven Moor shareholders to water; and I can only hope for their sakes (though I very much despond of such a result) that they may be rewarded by a similar discovery to that which we have in Llanrwst, and not merely have to "cloy the edge of hungry appetite by bare imagination of a feast." (Cheers and laughter.) If they send to market in the next five years as much lead as Capt. Knapp has sent in the similar period just elapsed, they will have to be congratulated upon a measure of success which the present appearances hardly warrant. The principal object of this individual in forwarding these statements to the shareholders is to bring in sellers of Llanrwst and buyers of those shares in which he is more interested. He lately effected a change of 400 Llanrwst shares for certain shares in the East Craven Moor and some Brewery Company (Limited). One thing seems rather strange, which is that he should laud the East and West Craven Moor, and yet be willing to exchange the shares of one of those mines for such "worthless" ones (as he wishes shareholders to believe) as those of Llanrwst; but I venture to assume that he bore in mind the important fact that while he could not sell East and West Craven Moor shares, he could find a market for Llanrwst shares, which he speedily began to offer at prices commencing at 19s., and going gradually down to 16s. and 15s., until he had sold the whole lot. Now that he has no more, perhaps for a little he will allow the company to pursue the even tenor of its way. I want shareholders distinctly to understand that but for the action of such individuals who have selected the Llanrwst shareholders for their profitable operations, the shares would now be realising from 2*l.* to 3*l.* a share. I have only to say, in conclusion, that I hope the proposition of the Chairman will be unanimously carried, for by cordially putting our shoulders to the wheel we shall complete the development of this valuable property, and do that which is best for ourselves and best for the company. (Cheers.)

Mr. ENDEAN: I have but little to add to the able address to which you have just listened, but it has been a source of great disappointment and regret to me to have to meet you under present circumstances. Twelve months ago I was firmly persuaded that you would be receiving cheques on account of dividends, instead of being asked to provide money on preference shares; but, unfortunately, we have had to pass, in common with other concerns, through a depression of trade the like of which is almost unexampled in our commercial history. Lead is a metal, however, that does not fluctuate violently; it takes a long time to go from one extreme to the other. When once down it continues to fall until its lowest point is reached, and as gradually it recovers. Now, I feel certain that the period of recovery has come. The tide never recedes so far but what it comes back again, and I am sure we have reached that turn which will bear us towards good times and revived commercial prosperity. Another point I would call to your mind is this, that our mine is not in the position of a Cornish one. In Cornwall the directors or committee meet the shareholders and simply say—"We need so much money," and a call is made, which the shareholders have to provide, whether they like it not. Under the Limited Liability Act under which the Llanrwst Mine is worked, the shareholders cannot be so called upon, and hence their position is more secure. Their liability is strictly defined, and for that reason I myself prefer the Limited Liability Act. But it has this disadvantage, that often when the goal of success is positively within reach you may be pulled up by want of capital, and unless you can induce the shareholders to subscribe the extra amount, which is often, as in our case, only a small one, the property is abandoned. Such a result cannot for a moment be contemplated in our case. Our mine has been proved to be too valuable (and the shareholders to-day have seen how well it is laid out and equipped in every respect) not to induce us to put the little more money into it that is required. No doubt that additional capital will produce the results long looked for. We have not done badly so far as we have gone; we have been challenged, and I answer that challenge with the statement, the proofs of which are undeniable, that about 4500*l.* (not 4000*l.* worth, as Mr. Gregory said) worth of lead has been sold in the time we have been at work, and that principally as the result of exploratory operations. We have furthermore discovered 17,000*l.* worth of lead, which is practically close to surface. When the mine first started there was really nothing done. The lead was taken away as the mine was opened out. We have now developed it to such a degree that we can extend its levels both right and left, and every fathom we drive enhances its value. In regard to the percentage to be offered for this preference money, I think you should give a sufficiently strong inducement to the shareholders and make it 10 per cent. and not 7½ as suggested by the Chairman. Capt. Knapp says that 10,000*l.* will be sufficient for his requirements, but it must not be forgotten that there are certain liabilities to be paid off, and the question is whether 10,000*l.* will be sufficient taking those into consideration.

The CHAIRMAN said that if they raised 10,000*l.* for the mine and 5000*l.* for the liabilities, that would be amply sufficient.

Mr. ENDEAN: With money Captain Knapp has told you that he will be able to return much larger quantities of lead. We have, as you must all have seen, one of the most complete sets of machinery that can be found on any mine. There is nothing more required. Everything is there that can possibly be wanted to sink the mine to the depth required. The engine will take us down more than 100 fathoms deeper. The dressing floors are quite adequate to treat 100 tons a month.

Captain KNAPP: As the ores become more concentrated (which they will do in depth) they will give a larger yield.

Mr. ENDEAN: With lead even at 11*l.* or 12*l.* a ton we should be able to make large profits. I need not tell you how deep was the interest my late lamented father took in this mine. It had become part of his very existence. It was ever in his thoughts, and its future prosperity was at once the hope and the confident belief of his life. He looked forward to it as a concern that would redound to his credit, and with the number of shares he held in it it would have been a fortune to him. Unfortunately, just after our last annual meeting, and whilst on a visit to the district to another mine, he was suddenly removed by the hand of death, and just before the time, too, when he believed this property would begin to realise those bright hopes he ever entertained with regard to it. At that very time he was expecting from day to day that it would begin to return sufficient ore to pay us a large dividend. When he was called away I assumed his position towards this mine as far as I could do so. I found that certain things were recommended for the benefit of the mine, and knowing that he had a large number of shares, and believing that it would be to my interest, as well as to that of the general body of shareholders, I made a free gift of some of those shares without any hesitation, and the proceeds were handed to the directors, placed to the credit of the company, and the money expended on the mine. (Cheers.) I recall that fact now in order that the shareholders may fully understand that I have not profited out of the shares that came to me, but that I have been willing to make a sacrifice for the general good. (Hear, hear.) As to the new capital, my own idea is that there should be 7500 shares at 10 per cent. interest, which, of course, the holders would receive before the ordinary shareholders got anything. I do not think that will at all interfere with the value of the ordinary shares, but rather that the new vigour with which we will be now able to work the mine will give an enhanced value to them. (Hear, hear.) I have now a further offer to make to the shareholders. I will give 1000 shares—nay more, I will give 1500 shares—to be divided amongst those who take up the preference shares—(cheers)—and I will take up 250 of those preference shares myself. (Renewed cheers.) It is with me a sort of *amour-propre* feeling, not merely on my own account, but on that of my father, whose interest in this mine I have already described. (Hear, hear.) My father, from the time of the commencement of this company to the time he died, looked upon this mine as everything to him, and I have been trying myself to carry out his ideas. In fact, so strongly do I feel on this point that I would rather forego every share I have than not see the mine turn out a success. If the shareholders will come forward now I will set apart 1500 of the shares that have come to me to be divided amongst those who subscribe for the preference shares, and I repeat that I will take 250 of the preference shares, which would represent a further investment on my part of 500*l.* (Loud cheers.)

Mr. CARTER remarked that this gift would represent one share in five.

It was then proposed by the CHAIRMAN, and seconded by a SHAREHOLDER, "That the capital of the company be increased by the issue of 7500 shares of 2*l.* each, to bear interest at the rate of 10 per cent., the administration of the vendor placing at the disposal of the directors 1500 of the ordinary shares—that is, one for every five as a bonus." (Carried unanimously.)

Mr. HELDEN (director): Mr. Endean said he was willing to take up 250 of the preference shares, and I shall be willing to take up my *pro rata* proportion, and the other directors will doubtless do the same. (Cheers.) That will give a start to the general subscription.

A SHAREHOLDER proposed a vote of thanks in the first place to Captain Gilbert, who had presided with so much ability over these lengthened proceedings, and to his colleagues; in the next place to Mr. Endean, for the very liberal way in which he had offered to assist the company at the present juncture; and in the third place to Capt. Knapp, for the care and attention he had bestowed in the development of the mine. He thought the shareholders should specially thank Mr. Endean for his generous offer, which was a proof of his desire for the prosperity of the company, as well as of his confidence in its ultimate success. (Cheers.) As to Capt. Knapp, anyone who had seen the surface works to-day must be of opinion that he had exercised considerable ingenuity and ability in bringing matters to their present prosperous state.

Mr. GREGORY seconded the motion, and said that this somewhat comprehensive vote of thanks was well deserved by all the persons included in it. He knew from personal acquaintance with Mr. Endean that it was his sole aim and desire, as it was that of his father, that this should become one of the first mines in the county. He felt convinced that so long as they had such an able manager as Capt. Knapp to develope its resources the company need not fear but that success would be obtained.—The motion was carried unanimously.

Major NESBITT returned thanks for his colleagues and himself. He said they had done the best they could under the adverse circumstances of the past year. It was extremely gratifying to be thanked for their services, such as they were, and he hoped the next time they met there would be better news for the directors to communicate. He hoped the shareholders would now support the directors by taking up the preference shares, and that in a few months the aspect of affairs would have materially changed for the better.

Mr. ENDEAN also returned thanks, and said he would assist the company in every possible way so that success might be achieved.

The CHAIRMAN proposed a vote of thanks to the secretary, Mr. Carter, and took the opportunity to express the appreciation of the directors at the satisfactory way in which he performed his duties.

The motion was agreed to *nem. con.*, and Mr. CARTER, in replying, said he was pleased to know that his humble endeavours had met with the approval of the board and of the shareholders. His duties had been arduous, much more so probably than most people would imagine, but what he had done had been performed with pleasure and alacrity, and he hoped always to merit the kind approval of all connected with the company.—The proceedings were then brought to a close.

PATELEY BRIDGE LEAD MINES AND SMELTING COMPANY.

An extraordinary general meeting of the shareholders was held at the offices, Austinfriars, on Tuesday—Mr. BAXTER in the chair—for the purpose of passing the following special resolutions, or such modifications thereof as may be then and there agreed on:—

1.—That the Pateley Bridge Lead Mines and Smelting Company (Limited) be wound up voluntarily.

2.—That Mr. James Henry Nicholls be and hereby is appointed liquidator.

3.—That in the event of a company being formed and registered for the purpose of working the said mines and premises with a nominal capital of 30,000*l.*, and in the event of the debenture-holders consenting to sell their said debenture debt and interest and all their right and interest in the said mines and premises to such a company for 7500*l.* in fully paid-up shares the liquidator be and hereby is authorised to sell the said mines and premises (subject to the said debenture debt), and all and every other the property and assets of the company (subject to the payment by such intended company of all debts, claims, and demands of every sort, kind, and description due from or incurred by the said Pateley Bridge Lead Mines and Smelting Company (Limited) for the sum of 15,000*l.*, in shares of such new company of the nominal value of 1*l.* each, 12s. 6d. of which amount shall be credited as paid-up upon each share, leaving a liability of 7s. 6d. per share, such shares, if and when received to be divided amongst the shareholders of the Pateley Bridge Lead Mines and Smelting Company (Limited), *pro rata*, in proportion to the amounts held by them respectively in the capital of the company.

4.—That the shareholders of the Pateley Bridge Lead Mines and Smelting Company (Limited) will accept such shares with such liability as aforesaid.

5.—That the liquidator shall have full power to carry out such an arrangement as that contemplated by the third clause of these resolutions, subject to such alterations or modifications (provided the amount of liability upon such partly-paid shares be not increased) as he may deem advisable without again calling the shareholders together upon the subject.

The notice calling the meeting was read by Mr. W. J. LAVINGTON, the secretary.

The CHAIRMAN said it was, perhaps, necessary and desirable to state briefly what the actual position of the company was. Shareholders holding 2665 shares out of the 3000 had already answered; of the balance many were in course of transfer, and others were in the hands of executors, and could not readily be dealt with. He thought this fact showed that the proposition of the directors had been very favourably received, having regard to the present state of things outside, and to the depressed condition of mines generally. The board had great confidence in the future of the mine, and certainly he had, personally, the greatest confidence. From the inception of the company they had had great adversity to pass through, and great difficulties to contend with. They had been crippled for want of working capital, and they had had to work the mine in a hand-to-mouth manner, in addition to which they had had the great disadvantage of lead being at an extremely low price. The price had improved recently, but he was sorry to say that improvement had not been fully maintained, and their output had of late been reduced from the Rake vein, the 30 having fallen off, and still more recently the output had been reduced for want of machinery. The manager was now sinking the

sump below the 30, which was yielding wonderful results, but during the last month or two he had got into more water, and until they got additional machinery he would not be able to work to advantage. He was happy to say the boiler had been received, and had been put in its place; the pumps had all been sent, and no doubt by now were on the ground. As soon as they were placed in position and ready to work Capt. Williams would proceed to sink another 10 fms., and intersect the lode, which, so far as he had sunk in the sump, had given 12 tons per fathom, which was a lode unequalled by any mine in England except the Van Mine, and he might also tell them that the lode continued at the present time. Having read extracts from Capt. Williams's report (which have already appeared in the *Mining Journal*) showing the excellent prospects of the mine, the Chairman went on to say that the present indebtedness of the company was 1800*l.*, which must forthwith be provided for. This includes the present month's working, and from what Capt. Williams said, the production would not meet the cost until they got the new engine at work. He had the greatest confidence that as soon as they got fairly at work they would turn the corner, and see very much better times than they had ever done before. If the produce continued anything like what it was now nothing could prevent them making large profits from that point alone. If these propositions were adopted the directors would make the calls as light as they could consistent with the safety of the company and the proper development of the works. Whatever was done would be done strictly in the interests of the shareholders. The debenture holders had a claim upon the property, and the directors thought that the fair thing was for the shareholders to subscribe a certain amount of money to protect the property and let the debenture holders be paid off in fully-paid shares, with a certain bonus, and the cordial support which the directors had received showed that the parties most interested had agreed to that.

In the course of a short conversational discussion which ensued, several shareholders expressed their approval of the proposition of the directors, and their entire confidence in the future of the company.

On the motion of the CHAIRMAN, the several resolutions given above were then put to the meeting and carried unanimously.

On the motion of Mr. F. MANSELL, a cordial vote of thanks was passed to the Chairman and directors, and the meeting broke up.

ROOKHOPE LEAD MINING COMPANY.

A general meeting of shareholders was held at the offices of the company, Austinfriars, on Monday,

Mr. WILLIAM EDWARDS in the chair.

The notice convening the meeting was read, and the directors' and agents' reports were taken as read.

The CHAIRMAN stated that full particulars of the financial position of the company and the prospects of the mine having been given in the directors' and agent's reports, issued to the shareholders, it would only be necessary for him to say that, owing principally to the severe winter experienced, the result of the operations since the general meeting in December had entailed a further loss. The directors had advanced a considerable sum from their own pockets to meet claims against the company and enable the works to be carried on, and they now proposed that each shareholder should contribute, in proportion to his holding, to a loan secured by mortgage of the mine and plant. If this scheme were adopted the property would still remain in the hands of the present proprietors, and the danger and expense attendant on a mortgage held by persons other than shareholders would be avoided. Capt. Tonkin in his report showed the average price of raising ore throughout the mine to be 4*l.* 10s. per ton of dressed ore, which amount would leave a fair margin of profit even at the present price of lead. The amount required for the work recommended was estimated at 500*l.* to 600*l.*, and even this would not be required were lead at its old price. The liabilities were about 1250*l.*, so that the total amount needed was (say) 2000*l.* They had now got through the worst of the winter, which had been of extraordinary severity, and as lead was rapidly rising in value there was every reason to believe that if funds were provided to meet the liabilities and carry out the operations named the result would be, as Capt. Tonkin stated, a lasting and remunerative industry.

After a discussion of a conversational nature the following resolution was adopted:—"It appearing that by the 69th Article of Association the directors have power to borrow to the extent of 5000*l.* on bonds of the company, or on mortgage of the company's property—Resolved that the directors be requested to mortgage the company's property, including the lease, mine, and plant, for the sum of 3750*l.*, the shareholders to be requested to subscribe for the same at the rate of 5s. per share on their present holdings, the interest to be at the rate of 10 per cent. per annum, and the subscribers to this advance to have the option of exchanging their respective sums for shares at par, to be created for the purpose in accordance with the company's Memorandum of Association, No. 5 clause."

It was stated that the directors, who hold nearly 2200 shares, would take their proportions, and several large shareholders had also promised to subscribe.

The usual compliment to the Chairman brought the proceedings to a close.

MILL DAM MINING COMPANY.—The annual general meeting of shareholders was held in the Cutlers' Hall, Sheffield, on Thursday, Mr. J. B. Wostinholm presided, and there was a fair attendance of shareholders. The report showed that the average sales of pig-lead for 1878 were over 4*l.* per ton below the average value of the sales made by this company in 1877. Although the output of ore had been increased the year's operations had resulted in a loss. The price of pig-lead had come down since this year came in, making the lowest price reached since 1838. It was thought proper by the directors to advise closing the mine for a period until the market value improved; but as this step would throw out of employment about 200 men and boys the meeting suggested that the miners should make some concession in the price now paid to them for raising the ore, in the hope that prices would improve. A call of 1*l.* per share was made to meet the current expenses of the mine. The directors, Mr. J. B. Wostinholm, Mr. R. S. Slack, Mr. William Walker, and Mr. Joshua Maxfield, of Sheffield, and Mr. W. A. Cook, of Manchester, were all re elected.

[For remainder of Meetings, see to-day's Journal.]

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week the amount of business doing has decreased, because as time passes, and the anticipated revival in trade makes little or no progress, confidence begins to weaken, and doubts arise that there may be commercial and financial difficulties still to be discovered and dispelled before any good can be done in trade generally. The money market continues very quiet at low rates, and this is the only influence at present to induce investors to place out their money to more advantage at the current exceptionally depressed prices of all mining and mineral securities.

In shares of coal and iron companies Monkland preference have advanced on the week 1*l.* 4s. per share; Moukland ordinary, 17s. 6d.; Arniston, 12s. 6d.; and Glasgow Port Washington and Marbella, each 5s. On the other hand, Lochore and Capledrae are reduced 2s. 6d.; Omoa and Cleland, 1s. 6d.; and Benhar, 1s. There continues to be almost nothing doing in Benhar; only a few sales at 13s. and 12s 6d. all the week. The Antrim Iron Ore Company have declared dividends on the A and B shares at the rate of 2½ per cent., or 1s. per share. Andrew Knowles and Sons are at 10½ dis. Ansley Hall 10 per cent. preference, 5. Ashbury, 8¾ dis. Bilbao 6 per cent. preference, 35½. Bolckow, Vaughan, A, 60½ to 61 (touched 64); ditto, B, 35 (touched 37); ditto, stock, 112 to 114 (touched 115); and ditto 5 per cent. preference, 19½. Cardiff and Swansea, 25s. Charles Cammell and Company, 15½ dis. Ebbw Vale, 70s. Henry Briggs, B, 6. John Brown and Company, 25 dis. Lehigh and Wilks Barre, 90. Leeds and Yorkshire Co-operative, 70s Lincolnshire Smelting, 20s. Monkland preference, 65s to 75s. Nant y Glo and Blaina preference, 14 to 16. Newport Abercarn, 5. Omoa and Cleland, 8s. 6d. to 7s. 6d. Pearson and Knowles, 25½. Rhymney, 15. South Wales, 55s. Thorp's Gawber Hall, 12s. 6d. Tredegar, A 14. West Mostyn 12 per cent. deferred, 5. Whittington Silkstone, 8.

In shares of foreign copper companies Tharsis have fallen 7s. 9d.; ditto (7*l.* paid), 2s. 6d.; and Huntington, 1s. Tharsis commenced higher, at 21⅞, but declined to 21¼. The dividend on these shares will be two months later in being announced this year, and, of course, it may not be quite as much, seeing how depressed trade has been. The output of New Quebrada for December and January has been 2000 tons, averaging per cent. 14 15. All the works are progressing well. Rio Tinto five per cents. 61¼. Yorke Peninsula (preference), 10s. to 12s. 6d.

Business in home mines has also been smaller. The prices of the leading shares have shown a tendency to improve of late; and, as they are still very low, investors should not delay longer to buy. If judiciously selected there are no securities in which it is possible to realise so great profits as these. Copper, lead, and tin have all begun to rise, and after so many years of constantly declining prices it is a justifiable assumption that when the turn has arrived they will continue to rise. Then the prices of shares in mines, many of which have been unduly depressed, are bound to have a great rise. The sale of copper ore by the Glasgow Caradon Company, on the 20th inst. (computed 130 tons), realised 740*l.*, or an average of 77s. 11d. per ton, and compares with 190 tons at 69s. 2d. last month, while the sales in the month of March for some years back have been:—In 878, 210 tons, at 46s. 9d; in 1877, 240 tons, at 89s. 8d.; in 1876, 260 tons, at 117s. 2d.; in 1875, 240 tons, at 106s. 2d.; and in 1874, 250 tons, at 78s. This is the company's third sale for the current financial year, and the proceeds of these sales, as compared with the sales in the corresponding period of last year, show an increase of 140*l.*; the company is thus improving its position. Great Laxeys are at 17. Killifreth, 2s. 6d. to 5s.; Leadhills, 40s.; Medlyn Moor, 2s. 6d.; Minera, 8 to 8½; Rhyd Alun, 38; Tankerville, 77s. 6d.; West Wye Valley, 15s. to 25s; Wheal Crebor, 1s. 3d.; Wheal Kitty (St. Agnes), 2s.

In shares of gold and silver mines the alterations are unimportant. This week's run of the Richmond is $66,000: the shares have not fluctuated more than between 9¾, buyers, and then sellers at the same. The profit at Almada and Tirito for January is $1100. Colorado United, 37s 6d. Don Pedro, 16s. Eberhardt, 82s. 6d. Emma, 2s. 6d. Exchequer, 3s. 9d. to 5s. Flagstaff, 2s 6d. to 5s. London and California, 1s. Port Phillip, 9s. Rossa Grande, 1s. 6d. to 2s. Sierra Buttes, 2½. Santa Barbara, 37s. to 39s. St. John del Rey, 265. South Aurora, ¼ to ⅜.

In shares of oil companies Uphall are 2s 6d. lower. Young's Paraffin have been quiet at 14½ and 14¾. Price's Patent Candle, 9¾. Rancorn Soap and Alkali, 6 dis.

Business in shares of miscellaneous companies is at a standstill. The second instalment of dividend of 15s. per share, declared for the year ended June 30 last by the London and Glasgow Engineering and Iron Shipbuilding Company, is payable on April 1. Native Guano are at 60s. Phospho-Guano, 6 to 7. In wagon companies' shares a reduction of 5s. would be accepted for either the original or new shares of the Scottish Company, at 7½ and 55s. respectively. Prices of others are—Bristol and South Wales, 6¾; Gloucester, 7; and Swansea, 40s. Prices of chemical companies' shares are—Langdale's, 82s. 6d. to 85s. 6d.; Lawes', 7¾ to 8; and Newcastle, 22s. 6d.

BOLCKOW, VAUGHAN, AND COMPANY (Limited).—At the 14th annual meeting of this company, the report submitted showed a profit available for distribution of 153,730*l.* The past year had been one of greater depression and lower market values than any for the last 25 years. The stocks of iron ore and other materials held by this company, therefore, were very large. The Aston Steelworks had been kept in full operation all the year. Referring to the patent which the company had recently taken out for the conversion of Cleveland iron into steel, the Chairman said the results of experiments with it had been very satisfactory. At present the limited power of their machinery only enabled them to convert small quantities, but a further extension of the works was being rapidly proceeded with, and they would soon be in a position to convert large quantities of the pig iron found in their district into steel at an extremely low cost. The directors feel sure that when normal prices were obtainable there would be a good return on their invested capital.

DARLINGTON IRON COMPANY.—The report prepared for the forthcoming meeting on March 28 shows a further balance to the debit of profit and loss account of 5136*l.* Out of this sum the interest payable to the vendors and others, as well as reserves for depreciation, would have been required if the works had been standing, and represent 5071*l.* In order to meet payments due, and if determined to commence the manufacture of steel, it will be necessary to make a call an an early date.

MINING IN NORTH WALES.—At North Hendre arrangements are being made for sinking a new pit. We hear they are about to erect a steam-engine, air-compressor, and employ rock-drills in sinking the shaft. The mine continues to open out very rich, and is supposed to have the richest deposit of ore in Wales. At Prince Patrick they have also a very rich mine, the deposit of ore being only second to North Hendre, and is, in fact, very similar. The present returns of ore—50 tons per month—leave a large profit, but can be increased to almost any extent. North Hendre and Prince Patrick are the safest shares in the market to buy, as there are large quantities of ore in stock on surface, and ever increasing reserves underground. Rhyd Alyn is a good property, and is being worked at a profit. They have several points at work in courses of ore of good quality. When the scheme for bringing out the new company is completed more extensive operations will be made here, and no doubt successfully. At the Victor, which is said to be the next prize in the Flintshire lead mines, the enlarging of the Coed Du adit level is nearly finished, and we are assured good returns of lead and blende will at once be made. Pant y-mwyn has about 70 tons of ore ready for sale, and the mine is reported to be progressing most satisfactorily, but the reserves, which were valued at a quarter of a million pounds sterling, do not seem to be getting reduced by any sales of ore. Reports of improvement are also being sent from the neighbouring mine. The late advance in the price of lead ore is having a very beneficial effect in the district, and has already resulted in the starting of one or two abandoned mines. If the times continue to improve sufficiently a really good lead property will soon be placed before investors, which is pretty certain to be a great success.

Capital. Per share.	Paid up.	Dividends. Rate per cent. per annum. Previous.	Last.	Description of shares.	Last price.
				COAL, IRON, STEEL.	
£10	£8	£ 7†	£ 5	Arniston Coal (Limited)	6⅜
10	10	4	4	Benhar Coal (Limited)	13s.
100	55	34s6d	25s	Bolckow, Vaughan, and Co. (Lim.)...A.	61
10	10	10	10	Cairntable Gas Coal (Limited)	5¼
10	10	4s April, 1876		Chillington Iron (Limited)	40s.
10	10	—	—	Clyde Coal (Limited)	40s.
25	20	10s Dec., 1874		Ebbw Vale Steel, Iron, and Coal (Lim.)	70s.
10	7	nil	nil	Fife Coal (Limited)	75s.
10	10	nil	nil	Glasgow Port Washington Iron&Coal(L)	55s.
10	10	—	—	Ditto Prepaid	55s.
10	10	—	—	Lochore and Capledrae (Limited)	27s. 6d.
10	10	nil	nil	Marbella Iron Ore (Limited)	35s.
10	10	nil	nil	Monkland Iron and Coal (Limited)	37s 6d.
10	10	5	4	Ditto Guaranteed Preference..	65s.
100	100	nil	nil	Nant-y-Glo & Blaina Ironworks pref.(L)	16
6	6	nil	nil	Omoa & Cleland Iron & Coal (L. & Red.)	6s.
1	1	15	15	Scottish Australian Mining (Lim)	35s.
1	10s.	15	15	Ditto New	16s. 3d.
Stock	100	nil	nil	Shotts Iron	99
				COPPER, SULPHUR, TIN.	
4	4	—	—	Canadian Copper and Sulphur (Lim.)	7s. 6d.
10	7	72s 6d	35s*	Cape Copper (Limited)	27
1	1	7½	2½	Glasgow Caradon Copper Mining (Lim.)	19s.
1	15s.	7½	2½	Ditto New	13s. 6d.
10	9¾	nil	nil	Huntington Copper and Sulphur (L.)	19s.
4	4	—	—	Panuelillo Copper (Limited)	25s.
10	10	6†	6†	Rio Tinto (Limited)	52s. 6d.
20	20	7	7	Ditto, 7 per cent. Mortgage Bonds..	13¼
100	100	5	5	Do. 5 p.ct. Mor. Deb. (Sp. Con. Bds.)	69
10	10	20	17½	Tharsis Copper and Sulphur (Lim.)	21¼
10	7	20	17½	Ditto New	14¾
1	1	—	—	Yorke Peninsula Mining (Limited)	8s.
1	1	—	—	Ditto, 15 per cent. Guaranteed Pref.	12s. 6d.
				GOLD, SILVER.	
1	1	—	—	Australasian Mines Investment (Lim.).	5s.
5	5	10s.	10s.	Richmond Mining (Limited)	9¾
				OIL.	
10	8½	—	—	Broxburn Oil (Limited)	10½
10	7	5	5	Dalmeny Oil (Limited)	6⅛
1	1	25	15	Oakbank Oil (Limited)	41s.
1	5s.	—	15	Ditto	11s.
10	10	7½	2	Uphall Mineral Oil (Limited) "A"	6⅞
10	10	—	—	Ditto "B" Deferred	10
10	8½	17½	17½	Young's Paraffin Light & Mineral Oil(L)	14½
				MISCELLANEOUS.	
50	25	5	6	London & Glasgow Engineering & Iron Shipbuilding (Limited)	21
7	7	10	5	Phospho Guano (Limited)	6¼
10	10	6	5	Scottish Wagon (Limited)	7½
10	4	6	5	Ditto New	55s.

† Interim. † Per share. * For six months of 1878.

NOTE.—The above lists of mines and auxiliary associations are as full as can be ascertained, Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a quotation for them, and such information as can be ascertained from time to to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.

Post Office Buildings, Stirling, March 27.

FOREIGN MINING AND METALLURGY.

In the Belgian iron and mechanical trades the complaints made now relate rather to low prices than to any absolute want of work. Thus, the John Cockerill Company has the full production of its iron and steel works engaged until August, and this is saying a good deal, having regard to the powerful means of production possessed by the undertaking. It is the same with some establishments in the Charleroi basin; the important adjudications of the last few weeks have brought a good contingent of orders. The Administration of the Belgian State railways has just let contracts for 54 locomotives. These important contracts have been divided between seven Belgian mechanical firms. The engines ordered are of four different types—passenger engines for heavy grades, goods engines, tank engines, and ten-wheeled engines for shunting purposes. The engines have been let at the same prices as those ordered for the Belgian State railways in September, 1878. M. Hanrez, of Monceau sur-Sambre, was invited to compete with other firms, but this industrial, not finding the prices offered sufficiently remunerative, retired from the competition. The question of the introduction of iron, and even steel, permanent way is being carefully studied by German railway companies, to which the Bochum and Krupp Companies have made serious propositions. The cost of a steel sleeper is estimated at 4s. 9d., or only 3½d. more than the corresponding cost of an iron sleeper. The John Cockerill Company has slightly reduced the cost of its steel sleepers, but even then they offer 40 per cent. more resistance. Iron permanent way, we may observe, has just been laid down on the Belgian State railways on the section between Bayssinghen and Hal. The traffic on this section is heavy, and express trains from Brussels to Paris and Calais pass over it; the new system will then receive a serious trial. A proposal made for the dissolution of the Charleroi Forgemasters' Association has been negatived.

It appears from an official return just issued that the aggregate production of coal in France in 1878 was 17,096,500 tons, as compared with 16,804,500 tons in 1877. The production is thus shown to have increased last year to the extent of 292,000 tons.

The demand for coal for industrial purposes has become more active in Belgium, in consequence of Belgian industrials having obtained a few more orders. The Belgian coal markets have been so long in a torpid condition that the last movement upon them deserves to be noted. Long-termed contracts have been rather keenly contended for of late. As regards coal for brick-making and lime-burning their sale has become rather more active of late; tthis is usually the case at this period of the year.

In dealing with the French coal trade we should have noticed the fact that the Parisian Central Company for Lighting and Heating by Gas has profited from the low price of coal in Great Britain, and has contracted for the delivery of English coal at reduced rates until the last few months of 1881—that is, for a period of nearly three years. The net profits of the company in 1878 exhibited an increase of 7148*l.*, as compared with 1877.

Many small orders for iron have come to hand in the French department of the Haute-Marne; these orders are not of much importance by themselves, but they are not without value in consequence of their number. Paris and the provinces have especially laid in reassortments. There have been no variations in prices to report as regards iron. In the Nord there is a great deal of business doing, but at rates which are comparatively profitless. At any other time the relative activity prevailing would have brought with it an improvement in prices. Instead of this, however, at each renewal of contracts purchasers seem to insist on a fresh reduction. Only forges producing an exceptionally good quality of iron can dispose of their production at 5*l.* 12s. per ton. The ordinary quotation at the forges is 5*l.* 10s., and even 5*l.* 8s. per ton. In the Loire-et-Rhône there are continued complaints as to the scarcity of orders. It appears that the total production of pig in France in 1878 was 1,508,200 tons, or 1420 tons more than in 1877. The total production of iron in France in 1878 was 681,700 tons, as compared with 745,000 tons in 1877. The production declined last year 63,300 tons. The production of steel in 1878 exhibited an increase of 36,000 tons as compared with 1877; the total production of 1878 was 289,200 tons. The Fives-Lille Company is stated to have secured some important foreign orders, which will assure its works employment for some months to come.

GOLD IN NEW ZEALAND.—It is estimated that the total quantity of gold, the produce of the colony, which has passed through the Customs since the first discovery in New Zealand is about 10,000,000 ozs., having an approximate value of nearly 40,000,000*l.* Since the Thames was opened in 1867 we have contributed to this amount no less than 4 500,000 ozs., the value of about 12,375,000*l.* It will be seen, therefore, that the Thames has done good service during its short decade in contributing to the wealth of the colony, and we have a right to participate in the public works expenditure when our quota of contribution has been so great. During a portion of the time the Government derived a tax of 2s. 6d. per oz. on our gold produce; but, taking the tax at 2s. on the total yield, we find that the Thames has added 1,237,500*l.* to the revenue of the colony in the exceptional taxation of its gold produce alone. Besides this special tax we have contributed in all the ordinary sources of taxation to a much larger extent than many other communities. Our population has been composed of a class of consumers who have offered gold in exchange for every dutiable commodity. We have had seasons of depression, when the yield has been less than formerly. Our highest yield in one year was valued at 1,118,708*l.* (1871) and our lowest at 160,927*l.* (1876). Under these circumstances our attention has been directed to the importance of opening up lands for settlement in order that we may no longer be entirely dependent upon our gold mining industry, with its fluctuation and taxation, but strive to produce in our own district what we have hitherto expended our substance in purchasing elsewhere. After years of patient waiting and expectation the present administration show a disposition to regard our efforts favourably, and to grant us that assistance out of the general loan expenditure to which we are justly entitled.

— Thames Advertiser.

A NEW INSTRUMENT FOR THE MINERAL ANALYST.—At a recent meeting of the Philadelphia Academy of Natural Sciences, Prof. Koenig, of the University of Pennsylvania, exhibited what he calls a chromometer (or colour-measurer), a new instrument he has designed for making exquisitely delicate determinations of the presence of certain metals in ores. It is based on the optical fact that complementary colours will extinguish each other if mixed in proper proportions—*e.g.*, if to a green solution a red solution be added in suitable proportion, the liquid will become colourless. Prof. Koenig has applied this principle to the colours which certain metals, as iron, manganese, copper &c., produce when fused with borax, the only chemical used in this method of analysis. He prepares such glasses or beads containing known quantities of a metal in one hundred parts, and observes how thick a glass of the complementary colour must be to produce extinction. This chromometer is furnished with a glass wedge of a green or red colour, cut at an angle of about 1°. By moving this wedge before the glass bead, with the help of a suitable rack movement, a scale is moved at the same time, and when the point of extinction of colour is arrived at the reading of the scale refers to a table showing the percentage of metal contained in the examined substance. By this method of analysis a correct determination of manganese in iron ore can be made in 15 minutes, which is not more than one third of the time required by the usual methods of analysis.

NEW AMALGAMATOR.—An improved amalgamator has been invented by Mr. JOHN B. REYNOLDS, of San Francisco, which consists in the use of a series of cylinders, in each of which a certain quantity of mercury is placed. The pulp is forced by a jet of steam into these cylinders and into the mercury, being heated and agitated at the same time. As it rises up through the mercury another spray jet of steam is forced against the pulp before or after it rises out of or on the surface of the mercury, thus breaking up any lumps or masses of pulp, and agitating the pulp and mercury together. The pulp passes out of the top of the cylinder, and another jet of steam forces it down under the mercury in the next cylinder. Any number of these cylinders and steam jets necessary may be used. The process is continuous, the pulp being violently agitated while entering each cylinder and receiving an accession of heat from fresh jets of steam as it passes from one to the other. Means are provided for controlling the supply of steam, preventing leakage, and for cleaning up the cylinders. It is claimed that the process is continuous in its action, and that no machinery is necessary for carrying the ore along through the cylinder. Steam may be supplied from the boilers which furnish steam for the crushing apparatus. The process employed is much more thorough than where amalgamation is attempted by passing the pulp over amalgamated copper plates, and is much less expensive than when the pulp is treated in pans, no loss of quicksilver being involved. When the cylinders are once filled with mercury whatever may pass over will be caught in the succeeding ones or the last one. The manner of injecting the steam for transferring the pulp from one cylinder to the other is very effective, not only for that purpose but for agitating and heating it as it goes through. Every particle of ore must go through the bath of mercury with no possible means of avoiding it, and the mass is so stirred and agitated during its passage that a thorough amalgamation of the precious metals is effected.

THE SCIENCE INDEX.—An elaborate work, which must have involved an enormous amount of trouble and research—"The Science Index, a Monthly Guide to the contents of the Scientific Periodicals"—has just taken its place among the publications of the day, Mr. A. HILDEBRANDT, A.I.C.E., of Manchester, having undertaken the not very enviable duties of editor. He truly remarks that there is hardly anything more tedious, time-absorbing, and unsatisfactory than either a reference to some particular article or series of articles which is vaguely known to have been published, or a search after some information momentarily wanted, but uncertain whether to be found anywhere or nowhere. Hence it is that much valuable instruction is lost to those whom it would benefit or who would at least be interested in it, and who at the same time may have it ever so close at hand. These difficulties will be completely removed by "The Science Index, a Monthly Guide to the English Scientific Periodicals," published as early as practicable in each month, and containing all the material requisite for easy reference to all articles of scientific or technical interest which have appeared during the previous month. It will consist of a classified alphabetical list of the titles and authors (if known) of the articles that have appeared in the periodicals, referring to number and page, and this will, in some cases, be rendered even more complete and useful by an indication of their salient points. "The Science Index" will doubtless be consulted by a large number of literary, scientific, and professional men who desire to economise their time to the utmost.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

PARYS COPPER CORPORATION (Limited).—Capital 45,000*l.*, in shares of 1*l.* To purchase or otherwise acquire, wholly or in part, the undertaking, mines, property, business, rights, assets and liabilities of Parys Mountain Mines Company (Limited), incorporated on August 2, 1870, or any other mineral property or mining rights. To work the mines now worked by the said Parys Mountain Mines Company (Limited), and any other mines which this company may acquire. To crush, reduce, smelt, and amalgamate the ore, and to render marketable the produce, and to develope the resources of the said or any other mines, whether belonging to the company or not. The subscribers (who take one share each) are—J. Y. Watson, 1, St. Michael's Alley, mineowner; F. F. Wilcott, 30, Finsbury-circus, secretary to public companies; W. Allen, Camberwell, accountant; F. Braby, 360, Euston-road, metal manufacturer; Napoleon F. Watson, 1, St. Michael's Alley, sharedealer; Charles B. Pavoy, Gracechurch Buildings, mining agent; H. J. Dean, Forest Hill, stock and share dealer. The number of directors shall not exceed five, nor less than three. The subscribers to the Articles of Association shall appoint the first directors, and until such are appointed the subscribers shall be the directors, remuneration to commence at 250*l.* per annum, but may be augmented as the shareholders in general meeting may determine. The qualification of future directors shall be 200 shares.

HOLYWELL HYDRAULIC LIME, WHITE STONE, AND CEMENT QUARRIES (Limited).—Capital 12,000*l.*, in shares of 5*l.* The purchasing or otherwise acquiring lands, wharves, rights of mining, quarrying, searching for stone and other minerals in lands situated in Holywell, Flint, and also the purchasing, leasing, or acquiring lands, mining and quarrying rights, &c., in the lands adjoining, for the purpose of carrying on mining and quarrying operations. The subscribers (who take one share each) are—H. R. Soelgrove, 7, Craven-street, C.E.; M. A. Purcell, Brighton, C.E.; R. Chandler, 66, Bishopsgate-street Within, solicitor; E. J. Bartlett, 30, Great St. Helen's, stock and share dealer; J. S. Eastes, 17, Water-lane, shipbroker; F. A. Purcell, 35, Welbeck-street, M.D.; J. H. Ginder, 46, Gresham-street, accountant.

SEGAL'S IMPROVED MINERAL TEETH MANUFACTURING COMPANY (Limited).—Capital 5000*l.*, in shares of 25*l.* The acquisition by purchase of the manufactory now carried on by Dr. A. Segal, 32, Hermes-street, Pentonville, or any other business of the same nature, the working, making, and selling of the products. The subscribers are—A. Segal, Pentonville, 40; E. B. Walmsley, 36, Porchester-square, 1; F. d'Armfelt, 27, Cornwall-road, 4; J. Cloke, Chelsea, 1; H. Tiedeman, 335, Strand, 2; S. H. Birt, Pentonville, 2; F. Pigon, 157, Ledbury-road, 1.

THE SUBURBAN FARM AND DAIRY PRODUCE CO-OPERATIVE SUPPLY ASSOCIATION (Limited).—Capital 100,000*l.*, in shares of 2*l.* To carry on the business of a co-operative society for the supply of all kinds of farm, dairy, and market garden produce. The subscribers are—Sir P. H. Clarke, Bart., Garington, 10; A. Middleton, 8, Charlotte-street, 1; R. D. Welch, Beckenham, 1; J. Biggs, 65, Stanley-street, 10; E. F. J. Brown, 66, Marquis-road, 1; R. E. F. Craufurd, 9, Northumberland-street, 1; W. G. D. Scott, 40, Langham-street, 1.

LAND COMPANY OF NEW MEXICO (Limited).—Capital 50,000*l.*, in shares of 100*l.* To acquire lands and interests in lands in New Mexico and elsewhere, and to manage, develope, improve, cultivate, let, or sell such lands and interests. The subscribers (who take one share each) are—J. H. Lloyd, 100, Lancaster Gate; G. G. Newman, 75, Cornhill; H. Johnson, 1, King's Cross yard; W. W. Wynne, 40, Chancery-lane; H. P. Blackmore, Salisbury; G. S. Gibson, Saffron Walden; Sir John Lubbock, Beckenham.

ANGLO-UNIVERSAL BANK (Limited).—Capital 2,000,000*l.*, in shares of 20*l.* To establish a bank whose head office shall be in London or Westminster, with branches or agencies in the United Kingdom and elsewhere. In the first instance to purchase (subject to ratification by the shareholders) the banking business of Dervien, Guillaumeron, and Cie, 48, rue de Provence, Paris. The subscribers (who take twenty-five shares each) are—G. Blount, 28, Old Burlington-street; J. Stainforth, Brighton; Hon. T. Preston, 6, Queensbury-place; A. Ferro, 21, Finsbury-circus; T. Edwards, Paris; H. Place, Paris; A. J. Dunn, 7, Draper's Gardens.

ROYAL EXCHANGE BANK (Limited).—Capital 1,000,000*l.*, in shares of 10*l.* The acquisition of the goodwill of the business and property of the Metropolitan Bank (Limited), and the carrying on the business as successors to such company in whole or part. The subscribers (who take one share each) are—J. E. F. Aylmer, 27, Walbrook; H. Blankley, Canonbury; Sir R. W. Carden, 2, Royal Exchange; J. Williams, 5, Elvaston-place; S. W. Causton, Clapham Common; T. Campbell, 5, Westbourne-street; Charles Keed, 69, Ladbroke Grove.

SOUTHAMPTON BOYS COLLEGE COMPANY (Limited).—Capital 5000*l.*, in shares of 5*l.* To establish and carry on a school or college for the education of boys. The purchasing or otherwise acquiring certain buildings in Southampton, and of any other buildings, land, and premises required for the purposes of the company. The subscribers are—General Tryon, Southampton, 1; F. G. Trippe, Southampton, 5; J. B. Baseley, Southampton, 5; J. P. Hine, Southampton, 5; H. Palk, Southampton, 5; J. S. Pearce, Southampton, 5; J. J. Burnett, Southampton, 5; H. M. Payne, Southampton, 5; W. G. Lankester, Basset, 5; J. J. Carter, Southampton, 5; J. Miller, Southampton, 5; A. J. Knight, Southampton, 5.

BRADFORD NEWSPAPER AND PRINTING COMPANY (Limited).—Capital 5000*l.*, in share of 5*l.* The establishing and carrying on printing and publishing in Bradford, or elsewhere in Yorkshire, of newspapers advocating Church of England and Conservative principles, and the power to purchase the copyright or goodwill of any newspaper or general printing business connected therewith. The subscribers are—George Firth, Bradford, 20; S. Ackroyd, Bradford, 20; W. Wright, Bradford, 20; D. Salmon, Bingley, 20; J. Ward, Bradford, 4; A. Raistrick, Thackley, 20; W. Greenwood, Bradford, 1.

LONDON AND PROVINCIAL WOOD PAVING COMPANY (Limited).—Capital 48,000*l.*, in shares of 10*l.* To carry into effect an agreement made between W. Prosser and James B. Brown, and to acquire by purchase, as expressed by the said agreement, the patent rights and privileges therein specified. To carry on the business of wood paving manufacturers, wood paviours, and contractors. The subscribers are—W. H. Holyland, Hurstpierpoint, 10; C. Richardson, Abingdon, 10; G. M. Edwards, Belvidere, Kent, 10; E. H. Hay, Barnet, 10; J. B. Brown, 3, Canonbury Park-square, 1; M. Pawson, 22, Doughty-street, 1; E. B. Pressland, Wood Green, 1.

COMBINED ESTATES COMPANY (Limited).—Capital 100,000*l.*, in shares of 5*l.* The provision of improved dwellings for the industrial classes. The acquisition from time to time of any property in England or elsewhere within the British dominions. The erection, maintenance, alteration, &c., of houses and buildings of any description thereon, the selling or otherwise dealing with lands, tenements, &c., in which the company shall have any estate or interest. The subscribers (who take one share each) are—G. S. Oldfield, Stoke Newington; T. Whitley, Canonbury; Ellen Rooke, 134, Mildmay-road; F. H. Rooke, 34, Lincoln's Inn Fields; A. B. Rooke, 11, Great St. James-street; A. W. Rooke, 11, Great St. James-street; Agnes E. Rooke, Canonbury.

TRAMWAYS SHARE INVESTMENT COMPANY (Limited).—Capital 1,000,000*l.*, in shares of 20*l.* To invest the capital in shares, stock, bonds, debentures, debenture stock, obligations, or other securities of any tramway, omnibus company, or undertaking in the United Kingdom or abroad; and to sell, purchase, exchange, or otherwise employ the said capital in the business of the company. The subscribers (who take one share each) are—H. Hudson, 32, Camberwell New-road; W. White, Lee; G. S. Smith, Londesborough-road; E. Squire, Deckheaton; J. E. Figg, 32, St. Mary's Axe; J. W. Wright, 47, Leadenhall-street; J. T. Figg, 9, Thorburn-square.

LONDON AND COUNTY HORSE AND CARRIAGE INSURANCE SOCIETY (Limited).—To carry on the business of insurance or assurance against accidental injury, damage, and destruction to horses and carriages. Every member undertakes to contribute to the assets of the company in the event of its being wound up during the time or within one year after he is a member, such amount not to exceed 10*l.* The subscribers are—R. Attenborough, Reading; F. Wright, Swanwick; H. J. Mirehouse, Bristol; S. W. Cox, Spondon; H. Fox, 6, Clarendon-road; E. H. Wilson, 16, Millman-street; H. Sinnett, 3, Great Queen-street.

HARTLEY, GREEN, AND COMPANY (Limited).—Every member to contribute to the assets of the company in case of its being wound-up when he is a member, or within one year afterwards, the costs and charges not exceeding 1*l.* The shares are in two classes—4*l.* voting shares and 2*l.* non-voting shares. To carry into effect an agreement on behalf of Hartley, Rayner, and Green (Limited), and George Green for the company. To carry on at the premises occupied by Hartley, Rayner, and Green (Limited), or elsewhere, the trades of general merchants, woollen manufacturers, saddlers, ironmongers, and all other businesses carried on by them. The subscribers (who take one 4*l.* share each) are—F. Hartley, Kelsall; T. H. Hartley, 1, Earl-street; T. S. Garrett, Leeds; Sarah Blakelock, Leeds; Annie Maude, Leeds; Joseph Hartley, Leeds; George Green, Highfield, Horbury.

GOLD ASSOCIATION OF FRENCH GUYANA (Limited).—Capital 200,000*l.*, in shares of 10*l.* To acquire by purchase or otherwise a concession granted by the Governor of the colony for mining rights over a tract of land situated on the left bank of the Mona, known as Placer Pas-trop-tôt, with the mines, works, mills, factories, erections, and buildings, also the apparatus, machinery, tools, and instruments belonging to or connected with the same. To acquire any other mines, concessions, licenses, &c., in the colony of French Guyana or elsewhere in South America, and to develope, open, and work any mines or other property belonging to the company. To carry on the business of mining, milling, smelting, washing, refining, and manufacturing of minerals and metals. The subscribers (who take one share each) are—A. K. Mackinnon, 22, Norfolk-terrace, M.Inst.C.E.; J. Alexander, 72, Adelaide-road, provision merchant; A. Preston, 88, Leadenhall-street, wholesale druggist; Edward Solbé, 10, East Cheap, merchant; J. V. Barber, 7, Elsworthy-terrace, gentleman; M. A. Walker, 4, Oakley-street, late captain 78th Highlanders; W. Southall, Pinners' Hall, accountant. The first directors will be named by the subscribers; subsequent directors will have to qualify in 25 shares each.

NATIONAL FOOD COMPANY (Limited).—Capital 5000*l.*, in shares of 5*l.* To act as merchants or agents for the sale of meat, fish, poultry, and other foreign and colonial produce. To carry on generally the business of importers and exporters of provisions and other goods. The subscribers (who take one share each) are—R. Wallace, 3, Kings' Bench Walk; W. F. Jack, 16, Mark-lane; J. E. C. Munro, 1, Kings' Bench Walk; W. B. Curry, Southgate; A. Fleuret, Wood Green; W. S. Rowland, Park-road; W. R. C. Moore, Clapham.

NORTH-WESTERN FIRE INSURANCE COMPANY (Limited).—Capital 1,000,000*l.*, in shares of 1*l.* To grant assurances upon any description of property against loss or damage by fire, and to carry on the business of a Fire Assurance Society in the United Kingdom and elsewhere. The subscribers (who take 500 shares each) are—T. Isherwood, Manchester; D. Smith, Heywood; T. Turner, Manchester; George Benson, Manchester; T. Popple, Heywood; E. Crabtree, Heywood; E. Diggle, Heywood; F. B. Jameson, Heywood; N. Hawarth, Manchester; W. T. Windson, Manchester; W. Lees, Manchester.

THE FOREIGN AND COLONIAL GOVERNMENT TRUST COMPANY (Limited).—Capital 2,449,983*l.* 10s., in preferred and deferred shares, each class subdivided into six series. To acquire all trust certificates, also coupons of interest and reversion. To sell, exchange, and dispose of any securities or investments of the company, and to carry on generally the business of a trust company. The subscribers (who take 10 preferred shares each) are—G. W. Currie, 26, Pall Mall; Sir P. Rose, 1, Cromwell-road; C. E. Lewis, M.P., 29, Norfolk-street; A. B. Abraham, 58, Cromwell-road; W. Trotter, 11, Hertford-street, W.; P. D. Grenfell, 69, Eaton-place; F. H. Jeune, 140, Cromwell-road.

AMERICAN INVESTMENT TRUST COMPANY (Limited).—Capital 750,000*l.*, in shares of 50*l.* To acquire in exchange for fully paid up shares, or by purchase, all trust certificates declaring the holder entitled to the benefits of participation in the investments and securities from the American Investment Trust. To sell, exchange, and dispose of any securities or investments, and to take over from the trustees of the said American Investment Trust all their securities, &c., and to carry on the business of a trust company. The subscribers (who take one preferred share each) are—G. W. Currie, 26, Pall Mall; Sir P. Rose, 1, Cromwell-road; C. E. Lewis, M.P., 29, Norfolk-street; A. B. Abraham, 58, Cromwell-road; W. Trotter, 11, Hertford-street; P. D. Grenfell, 69, Eaton-place; F. H. Jeune, 140, Cromwell-road.

LONDON AND PROVINCIAL COFFEE PALACE COMPANY (Limited).—Capital 10,000*l.*, in shares of 1*l.* To carry on the business of victualler and tavern and refreshment house keeper, except so far as the same includes the sale of alcoholic liquors. The subscribers (who take ten shares each) are—E. M. Denny, 55, Manchester-street; J. G. Sheppards, 28, Threadneedle-street; W. T. Paton, 23, Barnsbury Park; A. Jepson, 9, Old-square; Samuel Morley, M.P., 16, Upper Brook-street; C. C. Underwood, 13, Holles-street; S. Waite, 68, Harley-street.

THE INTERNATIONAL WINE COMPANY (Limited).—Capital 100,000*l.*, in shares of 10*l.* To acquire by purchase of the firm of Franck and Co. the goodwill, &c., connected with the business carried on at 22, Fenchurch-street, E.C., and to carry on the business of wholesale and retail wine, spirit, beer, tea, coffee, and tobacco merchants. The subscribers (who take one share each) are—F. W. Burger, 7, Idol-lane; G. Hesselman, Brixton; L. W. Jahn, Brixton; F. F. Lofts, Ealing; P. B. Caddell, 20, Mark-lane; L. H. Leon, 46, Houndsditch; F. Boill, Stoke Newington.

GENERAL FARM PRODUCE AND PROVISION COMPANY (Limited).—Capital 20,000*l.*, in shares of 2*l.* The dealing, buying, selling, and disposing of cattle, calves, sheep, lambs, pigs; also of poultry and game, butter and eggs, and all descriptions of fresh and cured provisions. The subscribers are—G. Burge, Herne Bay, 50; J. D. Macnamara, 94, Piccadilly, 25; W. A. Reeves, 6, Grosvenor-street, 25; W. R. E. Turner, Clapham, 25; T. Stephens, 178, Kensington Park-road, 2; J. B. Lane, 119, Ladbroke Grove-road, 5; L. Burrowes, Queen Annie's Mansions, 5.

LIBERIA COFFEE COMPANY (Limited).—Capital 150,000*l.*, in shares of 10*l.* To purchase leases, or otherwise acquire lands, for the cultivation of coffee, erect warehouses, factories, wharves, dwelling-houses, stores, and other buildings, plant, and machinery, in Liberia, and to carry on the trade of general import and export merchants. The subscribers (who take 20 shares each) are—F. Oswin, 10, Gower-street; E. Sutherland, 18, Berkeley-square; W. A. Ross, 260, Kennington Park-road; J. Bickerton, Altringham; T. Dane, 86, Finchley-road; F. Wilson, Whitehall; W. Stevens, 5, Helensburgh-street, S.E.

ROCK DRILLS.—According to the invention of Messrs. SCHRADER and FRITZ, of Essen and Suelz, a crank handle spindle carries a tooth wheel gearing with a pinion, on the spindle of which is a cam acting against a roller fitted in the end of a forked or double bracket fastened by a nut to a spindle, which can turn independently thereof, and is fitted with an outer flat helical spring and runs in bearings. The spring serves to bring the spindle against the rock and the cam pulls it back. The spindle is provided with a socket for holding a drill or chisel for working against the mineral surface; it has also a pawl wheel gearing with a pawl at each side, actuated by lever gear from the crank handle spindle. The drill rotates when the spring is compressed. The harder the rock operated on the smaller should the angle of rotation be; this is regulated by changing the relative position of parts of the lever gear. The apparatus may be mounted and made to slide on a frame consisting of two bars with a screw between; this screw is held at one end of the frame and has a nut fitted with worm wheel and held in bearings under the apparatus. The worm wheel is operated by an endless screw or worm actuated by the crank handle aforesaid, which is turned quicker or slower, according to the quality of the rock, or the worm may be operated by connection from the aforesaid lever gear. A special handle may be fitted to run the machine back quickly. The whole machine is clamped on to an upright column. A small truck on wheels serves to carry the apparatus, and can be fitted with a water reservoir and air pump. A jet of water may thus be sent into the bore-hole through an indiarubber hose fitted with cock.

ASBESTOS.

It is only recently that this substance has risen from simply being a mineral curiosity to an important article of commerce. Its great importance rests on its peculiar qualities, being indestructible by the action of fire, and acids, fibrous, and capable of being woven into cloth, or made into paper, and often as fine as flax or silk. According to Pliny, its sole use seems to have been for winding-sheets in which to burn distinguished dead, or to be spun into napkins, which were used only at great feasts, and from time immemorial in those localities where the substance is found the peasantry used it in the form of wicks for their lamps, for which purpose its power of capillary attraction renders it most serviceable. It is recorded of Charles I. that he had table-cloths woven of this substance, and it was a source of pleasure to him by throwing the soiled cloths into the fire to witness the astonishment of his guests as they saw them taken from the flames intact, white and purified.

Common asbestos is not indigenous to any special portion of the globe, but is found in abundance in most countries, and is more or less fibrous, but of a powdery quality. It is found in the veins and seams of the serpentine formation of rocks, which are blasted to procure the fibre, and rarely is it discovered in lumps; thus the quarrying process is similar to the ordinary routine of reaching mineral productions. The strong, long, fibrous quality, which is found in sufficient quantities for commercial purposes, is taken from the Italian Alps at elevations of several thousand feet. The price, which has raised from 10*l.* to 100*l.* per ton, according to the quality of the fibre, is likely to increase, owing in a great measure to the many uses to which it is being put, and principally on account of the enterprise which Italian capitalists are showing in manufacturing a substance of which their country has a virtual monopoly. The chief employment of asbestos is steam-packing for pistons and pump-rods, stuffing-boxes, manhole-plates, and a species of felting for covering boilers and steam pipes. No substance possesses greater adaptability to these purposes than asbestos, whose properties specially recommend it to resist a high temperature, moisture, friction, and flame itself.

On the American continent, where the manufacture of asbestos is assuming prosperous conditions, lining or sheathing paper for ceilings, floors, and partitions is attracting considerable attention. These papers are made in rolls of any thickness or length, can be printed with any desirable pattern, and render buildings not only safer in case of fire but cooler in summer and warmer in winter. The varieties of asbestos are almost innumerable, and no two localities seem to yield precisely the same fibre. In the Alps district alone, at least one hundred different sorts are found. In Great Britain the asbestos business is centred in the Patent Asbestos Manufacture Company (Limited), whose works are situated in Drumond-street, Glasgow, and whose enterprise in utilising a well-known mineral that has waited more than 2000 years to become a flourishing article of commerce, is attended with a remarkable degree of success. It is stated that this manufacturing company is the only one throughout the world who make the asbestos packing. It has had sufficiently severe trials of its endurance and adaptability by the most eminent and practical engineers, and their opinions regarding its valuable properties are unanimous. Among scientific men, asbestos has of late years excited the keenest interest, and has gained their unqualified approval as being pre-eminently the first in adaptability of all known substances to use where incombustibility and power of resisting acids and friction are essential. Since the formation of this company, seven years ago, unceasing experiments with asbestos have resulted in the production of many articles of utility. With an unlimited supply of the raw material, which at one time was a desideratum with the company, improved machinery and extended premises, they are in a position to fulfil large demands on very short notice. Not the least among the items of their manufactures is their patent covering for boilers, steam pipes, &c. As it is not in embryo, the public confidence which the company's wide range of experience of the material, with which they have revolutionised many points in mechanical appliances, has encouraged their experiments with this new covering, and the most satisfactory results may reliably be expected from it. It is applied like ordinary cement or plaster, and is easily manipulated. In ordinary coverings it is not only necessary to apply a coating of from 2 to 3 in. thick, but, owing to their friable nature, canvas, wire netting, or other material, is requisitely added to keep the inner material in close union with the hot surface; and in cases where vibration is experienced this precaution is not always attended with success, but where asbestos covering is applied a single covering, 1 in. thick, is amply sufficient, as its adhesive properties render the assistance of other matters superfluous. The well-known and favourite steamers "Columba" and "Lord of the Isles" have their cylinders covered with this material since they were built, and it is still in perfect preservation, and giving the utmost satisfaction. Great advantages are also claimed for this new covering for all marine engines and boilers in economising both space and weight, and its refractory property is probably even more advantageous in keeping the engine-room and adjoining apartments cool in tropical climes. Irrespective of the superiority of this new covering, we are informed the price the firm have fixed is only that of any ordinary boiler covering. Asbestos jointing, in the form of paste or cement, which, after severe tests of protracted duration, on account of its impervious resistance to acids, oils, high pressed steam, hot water and sugar liquors, claims to be more durable than those applications which have been formerly restricted to white and red leads or india-rubber.

Great improvements have recently been made in the asbestos steam-packing and millboard jointing. Their indestructibility and the self-lubricative properties of the former are unrivalled—which is demonstrated by the fact that since the commencement of their manufacture the demand has been trebled every year; and the extreme tests they have been put to has in every case, both in marine, locomotive, and stationary engines, been in every way satisfactory and highly complimentary to the firm. A marked improvement has been made in the outside covering of the packing; instead of the asbestos being wound round with the cotton, as when first introduced it is now enclosed in a tightly braided texture. The millboard jointing is also an admirable production and a great economiser of labour in machine shops. This jointing can be effectually and reliably used on a rougher face than any other; thus the tedious and lengthy process of getting up or facing the flanges, &c., is obviated. Knowing what has already been achieved in the various manufactures of asbestos, a glorious future is undoubtedly in store for it; and the great amount of confidence with which it is regarded among practical men is reassuring to the company that their manufactures will become staple among the articles in use in the mechanical appliances in this and other countries.—*Mercantile World.*

A SILVER MILL IN THE CLOUDS.—The largest and best arranged silver mill ever made has been lately built by the Pacific Ironworks, of San Francisco, for the Cerro de Pasco Mining Company, in Peru. It has 80 stamps, weighing 900 lbs. each; 44 five-foot amalgam-pans; 22 nine-foot reservoirs, with all the belongings of the newest and best kind. It is made in sections, with no single piece heavier than 500 lbs., because it must be carried by mules over very steep paths, about 150 miles east of Lima, to a height of more than 14,000 feet. There are 17,000 pieces altogether, having an aggregate weight of over 600 tons. The whole mill was built and shipped inside of 50 days. The Cerro de Pasco mines are the richest and most famous in the world, having already yielded more than $500,000,000 worth of silver. — *Der Techniker.*

MINING ACCOUNTS.—For several years past Mr. EDW. HEARD, of Truro, has been unceasing in his efforts to secure the presentation of mining accounts in a form that would enable shareholders to know their exact financial position, and the precise details of ores sold. As a natural result, he has been at times fiercely attacked at meetings, and it has even been said that the West Briton, of which Mr. Heard is editor and proprietor, had prejudiced the mining interests of the county. It is, therefore, particularly gratifying to learn that at the recent West Seton meeting the justness and beneficial effect of the position he has taken was unanimously acknowledged. In proposing the motion Mr. Michell remarked that no man had done so much for mining in the county as Mr. Heard. He knew that sometimes people did not like exactly to be a little put out, and ordered to take a little medicine, and sometimes Mr. Heard gave doses which were objected to, but at the same time they conduced greatly to their general health. When some people got a lash over their backs in the West Briton they did not seem to like it, but they generally very richly deserved it, and he believed that there never was anything said against anybody who was connected with mining in the county, in the West Briton paper, editorially, unless it was fairly and properly believed to be based on reasonable grounds, and that it was necessary in the interest of the mining public, and the public generally, that it should be said. Therefore he could not find fault with a gentleman who had acted conscientiously in what he did. They sometimes heard complaints, but if they took a business view of these matters, and looked at them fairly and dispassionately as an outside shareholder, he believed they should feel that the right thing had been done, the right thing had been said. He knew Mr. Heard had exposed and reformed many abuses, and he hoped that as long as he was able to put pen to paper he would continue in the same line of conduct. No man had done more public service in mining than Mr. Heard had done, and, whatever other people's views were, they should make it a matter of their own conscience and of public benefit. In acknowledging the compliment, Mr. Heard said that he had never but one object in view, the public interest and that of Cornish mining in particular. If people lost their money honestly in cost book mines they did not care so much about it, but if they did not like to be deceived. He knew gentlemen in London who were ready to invest half-a-million of money in Cornish mining, but he could not recommend them to do so at present. They were now suffering a just retribution for sins of the past, and he strongly recommended everyone to insist upon a true and faithful statement of accounts, accompanied with a balance-sheet. With regard to West Seton, he said he remembered receiving dividends of 7*l.* and 10*l.* per share. They had sold in that mine 783,000*l.* worth of mineral, and paid the lord of the mine 50,000*l.* in dues, and spent during that time nearly half a million of money in the way of labour and materials, and divided 250,000*l.* in dividends. He could only hope that they should have a tithe of that prosperity again.

EPPS'S COCOA.—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well *fortified* with pure blood and a properly nourished frame."—*Civil Service Gazette.* Sold only in packets labelled—"JAMES EPPS and Co., Homœopathic chemists, London."

REFINING COPPER.

In several kinds of crude copper supplied to commerce, and especially in the kind known as Chili bars, arsenic and antimony and tin are present to an injurious extent, and the ordinary methods of purifying or refining copper only remove these impurities imperfectly. The object of the invention of Messrs. WILKES and JOHNSON, of Birmingham, is to remove these impurities during the refining process, or reduce them to such minute proportions that they shall have no injurious effect upon the copper. Any impurity contained in the copper operated upon is so effectually removed or reduced, that from Chili bars and other impure kinds of copper, such for example as the copper precipitated from the solutions of copper salts by metallic iron, they produce copper of a quality equal to that known as best selected copper. The ordinary method of refining copper consists in melting it and agitating it by a rabble or stirring tool. The oxidising action of the air suffices for the removal of ordinary impurities, and brings the copper into a sufficiently pure state for commercial purposes; but where the copper to be refined contains arsenic, antimony, or tin the oxidising action of the air does not effect the removal of these impurities. The new treatment subjects the melted copper to more powerful oxidising action.

The impure copper in a state of fusion is treated with a mixture of slaked lime and copper scale or oxide of copper, or with a mixture of slaked lime and peroxide of iron or of manganese. The copper scale they employ is the scale produced in the rolling of copper, and consists of oxide of copper. Although they prefer to use the copper scale or oxide, and the hematite or peroxide of iron, and the peroxide of manganese mixed with calcic hydrate or slaked lime, yet the crude soda called in commerce soda ash, which possesses the same basic properties as calcic hydrate or slaked lime, and is not costly, may be used in place of calcic hydrate. The materials employed are reduced to a fine powder, and are then thoroughly mixed together before being used. The relative proportions of the materials which they have found to answer well in practice are as follow. They do not, however, confine themselves to these proportions. When they use copper scale or oxide of copper they add to one part by weight of the copper scale or oxide of copper three parts by weight of calcic hydrate or soda ash. When they employ hematite or peroxide of iron they add to one part by weight of the said hematite or peroxide of iron two parts by weight of calcic hydrate or soda ash. When they employ peroxide of manganese they add to one part by weight of the peroxide of manganese two parts by weight of calcic hydrate or soda ash.

Into a charge of copper to be refined, melted in a refining furnace, the said charge consisting of 7 or 8 tons, they throw 3 cwts. of either of the mixtures described above, and thoroughly incorporate the mixture with the melted copper by a process of rabbling. After the mixture has been thoroughly incorporated with the melted copper the furnace is closed, and the temperature raised until the slag formed is fit to be skimmed off. The process described is repeated until by trial samples taken and examined in the usual way the arsenic, antimony, and tin are found to have been wholly removed, and the copper to have the properties of selected copper.

The slags containing the arsenic, antimony, and tin, together with 20 or 30 per cent. of copper, are either smelted with a reducing agent, and the metallic copper obtained therefrom cast into cakes, or the said slags are smelted with regulus or a sulphide ore of copper, the proportion of slag and regulus being so adjusted that the product formed shall contain 50 per cent. of copper. After the slag has been carefully skimmed off in the process last referred to there is added to the regulus a mixture of one part by weight of oxide of copper and two parts by weight of soda ash in the proportion of about 6 cwts. of the said mixture to 4 tons of the regulus. By rabbling the arsenic, antimony, and tin are oxidised, forming arseniate, antimoniate, and stannate of soda, the mixture of which is skimmed off and thrown into a tank containing water. The water dissolves out the above salts—arseniate, antimoniate, and stannate of soda, any copper or copper compound being undissolved. The proportions hereinbefore given of the several ingredients in the mixtures they employ, and the proportions of the said mixtures to the copper or regulus under treatment they have found to answer well in practice, but the proportions in each case may be varied considerably without materially affecting the result.

TREATING WASTE SULPHURIC ACID.

At the present time sulphuric acid is largely used in the manufacture of tin and terne plates, for pickling the plates of iron previous to coating them with tin or terne metal. Spent liquor so obtained is for the most part either evaporated down in open vessels to obtain copperas, or in some cases looked upon as a waste product and allowed to run to waste, fouling the rivers or streams into which it is allowed to run. As an improvement upon this Messrs. LAVENDER, RICHARDS, and WILLIAMS, of Pontypool, propose to distil the spent liquor to obtain a dry residue and afterwards roast this residue in highly heated retorts to obtain sulphuric acid. In carrying out the invention they take the spent liquor that has been used for pickling the iron plates previously to their being tinned and filter it. The filter they employ for this purpose is constructed of wood, either lined with lead or otherwise. At the bottom of the vessel is a perforated false bottom, upon which the bed of filtering material is to rest. They find it convenient to place over the false bottom a layer of about 1 in. thick of unspun hemp, and upon this a layer of sawdust, and then another layer of hemp. As the filtering progresses the sawdust deposited from the liquor is removed from time to time, as may be necessary. The liquor passing from the filter is collected in a tank.

In order to distil the liquor, to drive off the water contained in it, they place the liquor into a V shaped or other suitable vessel. They find that lead lined vessels are the most suitable, or they may be of wood, but other suitable material might be used. They then pass up through the liquor jets of superheated steam at a temperature (say) of about 600 to 700° Fahrenheit. The temperature of the liquor is thereby raised and the water evaporated. They carry on this process until nearly the whole of the water is expelled, and a residuum of what may be termed anhydrous sulphate of iron remains. This they take out of the pans when hot and cast into moulds; when cold they crush it into a fine state. Other methods than the one above described may be employed for distilling off the water contained in the spent liquor; the way described is, however, very convenient for the purpose.

The powdered residuum they transfer into shallow fire-brick pans or pans of other suitable substance, which are then put into retorts constructed of iron or fire-brick, or in ovens provided with suitable ledges or shelves. If retorts are used they may be placed in sets in a furnace in a similar manner to what is practised in the manufacture of gas or the distillation of shale, and the furnaces may be similarly constructed. The vapours arising are conducted by means of pipes or flues during the process of distillation into lead chambers These vapours consist principally of sulphurous fumes and acid. At the same time they insert into the retorts or ovens vessels containing nitrate of soda and sulphuric acid. The nitrous fumes thus given off pass along with the sulphur fumes into the lead chamber, into which they introduce steam jets, in the same way as when making sulphuric acid in the manner now generally employed in this country. The residuum left in the retorts or ovens being red oxide of iron, is prepared as a pigment used for paint, or prepared for polishing metal, glass, and other substances.

SLIP-LINK FOR COUPLING CHAINS.—An improved slip-link, likely to be of considerable utility in connection with underground haulage, has been patented by Mr. FRANK KINGSTON, of Catherine Grove, Greenwich, by which the parts of the chain or rod can be readily and rapidly connected or disconnected. For this purpose he constructs the link in two parts, jointed together at the one end, with an eye half in each part at the other end for the reception of the link or loop. Between the two hinged parts is a spece containing a helical spring, and outside the two parts is a sliding sheath, a pin of which bears on the spring. This sheath is made taper to fit on the exterior of the two parts of the link, which are also tapered; the spring forces the sheath forward so as to press the two parts of the link together, and so close the eye which receives the link or loop; but on pulling back the sheath the two parts of the link are opened, or are left free to open away from each other, sufficiently far to let the link or loop be drawn out of the divided eye, or to be inserted into it; and to facilitate its insertion the split of the eye may be made trumpet mouthed. In employing the link above described for chain it may be attached to or combined with a traction spring of any known construction for easing the strain at starting the vehicle.

MANUFACTURE OF SULPHIDE AND OTHER COMPOUNDS OF ZINC.—The invention of Mr. C. F. CLANS, of Charlotte-street, Fitzroy-square, consists, first, in a process for the production of chloride of zinc from the galvanisers' refuse, called skimmings, which consists chiefly of chlorifie of zinc, oxide of zinc, some sal ammoniac, and considerable quantities of salts of iron. The object of this part of the said invention being to separate the chloride of zinc from the salts of iron with which it is contaminated. The invention also includes the extraction of zinc from roasted blende, or calamine from zinc ashes or skimmings, by boiling the same with a solution of chloride of ammonium.

THE CLEVELAND STEEL DISCOVERY—FURTHER PARTICULARS.—From time to time various statements have been put forth announcing that this desirable discovery had been made, and they were in part true. Cleveland steel is no new discovery. So far back as ten years ago Mr. Samuelson, M.P. for Banbury, put down an expensive steel plant at Newport, near Middlesborough, and sunk some 40,000*l.* in experimenting on the Siemen's process, which ultimately proved a failure, not that steel could not be made, but because the *modus operandi* involved too great an outlay to secure mercantile success. Quite recently Messrs. Hopkins, Gilkes, and Co. nave made steel by improvements and modifications on the Danks process, but the product was too costly to compete with the Bessemer steel already in possession of the market. Mr. Jno. Gjers, the well-known Cleveland ironmaster, also took out a patent for the manufacture of steel from Cleveland iron, and it is said that Mr. I. L. Bell, who has spent some 25,000*l.* at the instigation of the North-Eastern Railway Company, in experiments, now said to be on the eve of being successful, at the Erimus Works, near Stockton, is following Mr. Gjers's lines, Bolckow, Vaughan and Co.'s experiments with the new process, of the success of which there need be no manner of doubt, have been carried on at their old ironworks in Middlesborough, and not at their new steelworks at Eston, as is generally supposed. The gentlemen who have had charge of the experiments are Messrs. Thompson and Gilchrist, the latter being well known as a late manager of the Blaenavon Works, in Wales. The process is a modification of Bessemer's, and the means by which the phosporous, the deleterious ingredient in the Cleveland stone, is got rid of are a patent lining for the converter, and the infusion of a chemical substance having affinity for the phosporous. Though the blast steel has already been made in considerable quantities the product is regular and reliable, and the directors of Messrs. Bolckow and Vaughan are sanguine that they can make steel from the abundant local ores which they will be able to offer in the market at lower rates than those now obtaining. The Sheffield steel makers have to obtain their ores from Cumberland and Spain, and are greatly burdened by the inland carriage. The Barrow makers depend upon coal and coke supplies from the far away districts of Cumberland, Durham, and Northumberland, whilst Cleveland has its iron ore and its coal and coke supplies close at hand, and in addition has splendid facilities for shipment. The difference in dues alone must be about 5*s.* per ton in favour of Cleveland. The way in which the directors of Messrs. Bolckow and Vaughan regard this discovery is best seen from the fact that they have within the past fortnight entered into arrangements to purchase the eight furnaces at South Bank, which were formerly the property of Mr. Thomas Vaughan. This will bring the total number of their blast furnaces up to 28—by far the largest iron and steel smelting plant in the world. They also contemplate recommencing their old mills at Middlesborough with the new manufacture, and already they are getting the plant ready in No. 3 mill for the making of steel fish-plates. The new discovery cannot fail to give a great impetus to local trade. Already it has had a good effect on the shares of the great companies in the district; the nominal capital of Bolckow, Vaughan, and Co. is now 3,650,000*l.*, and the profit made on last year's working, according to the report just issued, is 153,730*l.* 4*s.* 9*d.* The career of the company has been one of unimpeded prosperity, and there is reason to believe that its future will be even more successful than its past. Steel is the great metal of the future—iron plates, angles, and bars will soon be numbered, like iron rails amongst the things of the past, and steel will take the leading place in the markets of the world.

RAILWAY CARRIAGES FOR THE KING OF ITALY.—The Metropolitan Railway Carriage and Wagon Company have just completed at their works at Saltley a pair of magnificent saloon railway carriages for the use of the King and Queen of Italy on the Royal Sardinian Railway. Both carriages have been constructed on Mr. James Cleminson's system of flexible wheel base, the object of which is to enable carriages and all kinds of railway rolling stock to traverse both curves and straight lines with equal facility. Since the days of Stephenson it has been the practice to make rolling stock fitted only to run along straight lines, and so long as railways could be made straight, as Stephenson originally constructed his lines, there was no difficulty in working rolling stock economically under those conditions. With, however, the development of railways and their extension to places hitherto considered inaccessible, curves have become an absolute necessity, and although this has been recognised by railway makers, rolling stock seems to have been entirely forgotten; for, strange as it may seem, it is made upon exactly the same principles as those which prevailed in the days of Stephenson. Mr. Cleminson's system, while utilising everything which practice has shown to be sound and practicable in the mechanical details of rolling stock, makes rolling stock equally adapted to work round the sharpest curves as along straight lines. The economical results yielded by the system are admitted on all hands to be as thorough as the inventor contemplated. No better proof of this could be adduced than the fact that although the invention has been before the public but three years, it is to be found in operation in every quarter of the globe. The carriages just completed for the King of Italy have been executed under the supervision of Mr. John Rawlins, the company's manager, and are in every respect as excellent specimens of the carriage-building art as one could possibly wish to meet with. The vehicles are each 36 ft. long and 8 ft. 6 in. wide, the height from floor to ceiling being 7 ft. 6 in. They are constructed entirely of teak, the exterior wood having been selected with scrupulous care and with the most happy results so far as the grain is concerned. The *commode* handles and metal furniture generally have been silver plated. In the interior the central portion is the main saloon, which is framed in beautifully grained bird's-eye maple, and decorated and furnished in the most exquisite taste, and with the utmost regard for the convenience and comfort of the Royal passengers. At each end of the saloon is a passage, having on one side a retiring room and on the other a boudoir, all fitted up most elegantly. The two ends of the vehicle are open-air balconies, the metal framework of which has been wrought in an excellent manner and gilt, with a view to his harmonising with the complete structure. Altogether the carriages have been finished in a way that reflects the highest credit upon those engaged in their construction.

THE SLIDE RULE.—A pamphlet which will prove of great practical utility to a large number of workmen has recently been issued by Messrs. JOHN RABONE and SONS, of Birmingham; it is a concise and lucid little treatise on the Carpenter's Slide Rule, its History and Use. The extent to which the slide rule can be applied to the solution of questions of proportion by mere inspection is but very inadequately understood by many who constantly carry the instrument in their pocket; but some idea of its general usefulness may be judged of from the fact that even the little pamphlet in question gives instruction, amongst other things, for the measurement of all kinds of boards and planks, timber in the round or square, brickwork, tiling and slating, measurement of vessels of various shapes, the wedge, inclined planes, wheels and axles, levers, the weighing and measurement of metals, and all solid bodies, cylinders, cones, globes, &c., the measurement of circles, and the comparison of French and English measures. By the expert use of the slide rule many problems of every day occurrence amongst workmen, and which by the common process involve long and laborious calculations, can be solved by a mere glance at the rule, and Messrs. Rabone's pamphlet explains how this expertness may be attained.

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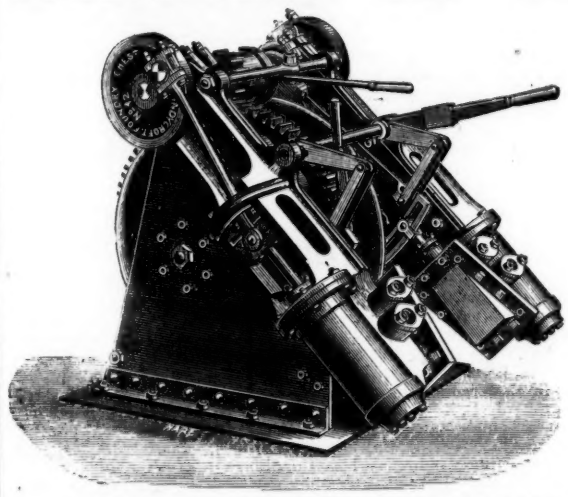

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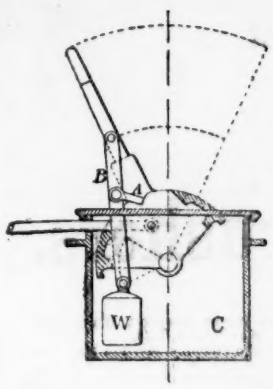


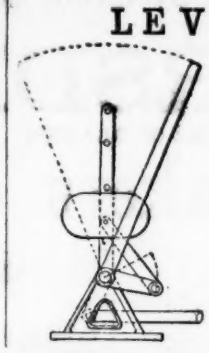
Hartley's Patent Lever Box,

REVERSIBLE UNDERGROUND,

Can be set to work either way; by turning over the catch at A and reversing the lever, the weight W swings over to C, the catch preventing its return until again turned over. The reversing is effected with very little power, as the weight is raised but a few inches in the operation.

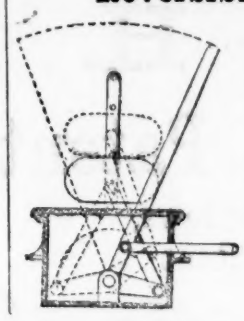
HARTLEY'S PATENT

LEVER BOX.



Specially designed for Colliery Workings, or where economy of space is an object. Is reversible, and can be locked either way, or dead-locked, so as not to work at all.

Hartley's Patent Locking and Reversible Lever Boxes,



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Will set over both ways, can be locked so as to work on one side only, or the switches can be locked on either side, so as not to work at all. Takes up less room than any other, as the weight does not turn over; works equally well if full of water; can be supplied at the price of an ordinary lever box.

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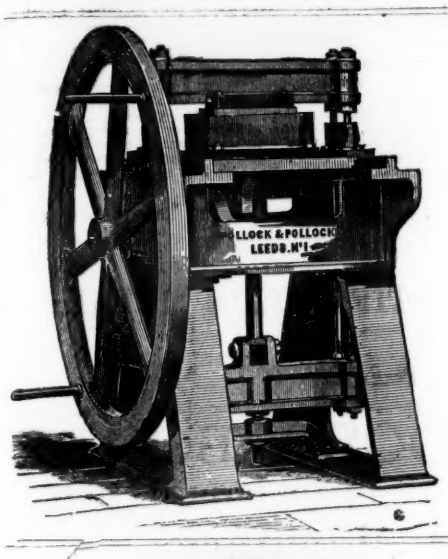

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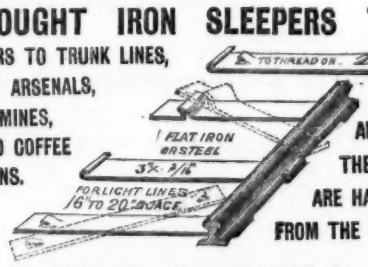

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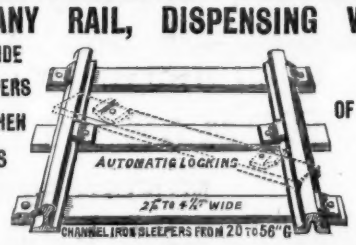

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WEDGE KEY
Do-Do- WITHOUT OUTSIDE BEARING
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OVER **2500** IN USE.

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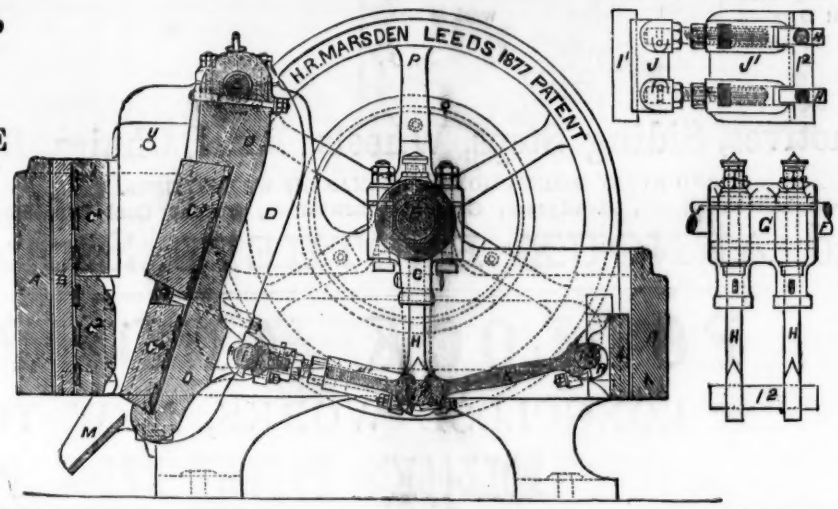

READ THIS—

Wharthole Lime Works, Maryport, Whitehaven, November 7, 1873.

H. E. MARSDEN, Esq., Soho Foundry, Meadow-lane, Leeds.

DEAR SIR,—The machine I have in use is one of the large size, 24 in. by 12 in. The quantity we are breaking daily with this one machine is 250 tons, the jaw being set to break to a size of 2½ in. We have, however, frequently broken over 300 tons per day of ten hours, and on several occasions over 360 tons during the same period. The stone we break is the blue mountain limestone, and is used as a flux in the various ironworks in this district. We have now had this machine in daily use for over two years without repairs of any kind, and have never had occasion to complain of any inconvenience in using the machine. I hope the one you are now making for me may do its work equally well. The cost—INCLUDING ENGINE-POWER, COALS, ENGINEMAN, FEEDING, and all EXPENSES OF EVERY KIND—is just 3d. per ton. Should any of your friends feel desirous of seeing one of your machines at work, I shall have much pleasure in showing the one alluded to.

I am, dear Sir, yours very truly,
WILLIAM MILLER.

AND THIS—

Wharthole Lime Works, Aspatria, Cumberland, July 11th, 1878.

H. R. MARSDEN, Esq., Soho Foundry, Leeds.

DEAR SIR,—We are in receipt of your letter of 4th inst. I may just state that the stone breaker above named has been under my personal superintendence since its erection, and I have no hesitation in saying that it is as good now as it was five years ago.

I am, dear Sir, yours faithfully,
FRANCIS GOULD.

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